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IN

ZOOLOGY

WILLIAM EMERSON RITTER
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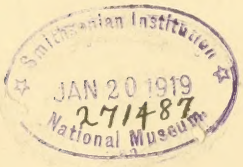
EDITORS

VOLUME XV
WITH 38 PLATES



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ERRATA

Page 91, opp. number 2610. *For* 93, *read* 39_7.
Page 102, opp. number 3322. *For* 3:33 P.M. *read* 3:35 P.M.
Page 163, opp. number 1823. *For* P.M. *read* A.M.
Page 227, opp. number 4259. *For* $60_{(25)}$ *read* $61_{(25)}$.
Page 240, opp. number 5015. *For* 04_4 *read* 40_4.

CORRECTION

The term "light intensity" (page 279, line 8) is only applicable to the interval between sunrise and sunset. For the remainder of the twenty-four hour period the general term *radiation* should be used. I am indebted to Dr. E. A. Birge of the University of Wisconsin for calling my attention to this error.

Also the estimate of the coefficient of absorption from temperature data is less than the actual value. A detailed discussion of this matter is given in my paper on *Ocean Temperatures, their Relation to Solar Radiation and Oceanic Circulation,* to be published as one of the volumes of the semicentennial series of the University of California. GEORGE F. MCEWEN.

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DEPENDENCE OF MARINE BIOLOGY UPON HYDROGRAPHY AND NECESSITY OF QUANTITATIVE BIOLOGICAL RESEARCH

BY

ELLIS L. MICHAEL

UNIVERSITY OF CALIFORNIA PRESS
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DEPENDENCE OF MARINE BIOLOGY UPON HYDROGRAPHY AND NECESSITY OF QUANTITATIVE BIOLOGICAL RESEARCH

BY
ELLIS L. MICHAEL

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1. Introduction

During the past fifteen years the Scripps Institution, and its forerunner the San Diego Marine Biological Association, have been making a biological and hydrographical survey of the waters adjacent to the coast of Southern California. Intensive rather than extensive research in marine biology is the leading idea of this survey, and, although this involves the acquisition of detailed information concerning particular marine organisms, knowledge of the biology of the sea is the ever-present ideal. How is this ideal to be approached? Certainly not by isolated investigations prosecuted under the Institution's auspices by biologists sojourning in Southern California, nor by investigations made for the purpose of advancing any general biological theory. *Continuous and co-ordinative research of several highly trained specialists is the first essential.* Under certain conditions the Institution is

not only glad but eager to give visiting naturalists opportunity for prosecuting their own researches, and special phases of general biology are studied from time to time. It is realized, however, that the ideal sought can be approached only by a programme of research which involves highly specialized and intimately co-ordinated investigations on particular and restricted problems concerning the structure, development, function, behavior, etc., of particular species of marine organisms. But even such specialized investigations can be included in the Institution's marine programme only when subordinated to the larger problem of understanding the sum total of the phenomena of marine plants and animals.

Necessarily, this programme demands thorough investigation of the conditions under which marine organisms live. Knowledge of the environment is as indispensable to a complete understanding of marine organisms as is that of the organisms themselves. "Conditions of the water as to temperature and currents; mineral, gaseous, and albuminoid content, etc., must be known *at the particular time and place to which the biological studies pertain.*" (Ritter, 1905, p. ix.) Chemistry, physics, and hydrography are therefore as indispensable in understanding any marine organism as is morphology, embryology, or physiology. Some biologists, however, hesitate to admit this, not recognizing that their attitude is equivalent to claiming that a marine organism can be completely understood without taking into account its most characteristic quality—its *marineness*, so to speak.

It has been impossible, thus far, for the Institution to conduct chemical investigations on the environment of marine organisms, but much time has been devoted to physical and hydrographical research. Since 1908, when intensive hydrographic research was begun, more than four thousand observations of salinity and density have been made and nearly five thousand surface and subsurface temperatures have been taken within one hundred miles of the coast and between Point Conception (34° 30′ N) on the north and Los Coronados (32° 10′ N) on the south. Within this area two hundred and sixty arbitrarily delimited rectangular "sections," each five minutes on a side, have been investigated, more than five hundred hydrographic observations having been made in some. But this is insufficient. Knowledge of the typical, average, and extreme physical conditions in temperature, density, salinity, and current in each "section," at all depths, at all hours of the day, during each month, and during each of a series of years, is needed to supply an adequate foundation for detailed con-

clusions respecting the relations maintained between marine organisms and the hydrographic elements of their environmental complexes. Such information, greatly restricted because of incompleteness of data, is given by Dr. McEwen in his "Summary and Interpretation of the Hydrographic Observations made by the Scripps Institution," the last paper in this volume.

What justification has the biologist for his deep interest in hydrographic matters? To be sure, they concern the conditions under which marine organisms live, but is such intensive investigation fundamentally valuable and necessary to the biologist? Cannot all essential knowledge concerning the relation between marine organisms and their environments be ascertained as accurately and much more expeditiously by subjecting a few typical organisms to carefully controlled laboratory experiments? Such are some of the questions continually being asked, and the primary purpose of this paper is to inquire into their significance.

The first step in this inquiry consists in distinguishing between *marine biology* and *general biology*. To discuss completely all the implications involved in this distinction would require more space than this paper permits. They have been pointed out over and over again by the Institution's director, to whom I am indebted for many valuable suggestions. The time seems opportune, however, for assembling certain facts revealed by my own research which support these implications and for combining them into an organic whole, to the end that some of the too prevalent misconceptions concerning the nature and function of marine biology may be corrected.

2. Marine Biology vs. General Biology

To understand marine organisms is obviously the function of marine biology. To what extent and why do marine organisms differ in structure, function, and behavior from land and fresh-water organisms, and how did these differences arise? In short, *by virtue of what is a marine organism marine?* This is the central question of marine biology: all others are strictly tributary to it. Possession of gills, swim-bladders, fins, webbed feet, etc., adapts animals, morphologically, to an aquatic but not necessarily to a marine habitat. The fundamental problems of morphology and cytology, regarded as branches of marine biology, are therefore contained in these questions: What are the niceties in structure which adapt marine animals and

plants to a life in the sea rather than to a life on land or in fresh water? How and why did such structural adaptations arise? What is it in structure that prevents marine animals and plants from living on land or in fresh water? Again, the fundamental problems of physiology, regarded as a branch of marine biology, is to determine the niceties in function which adapt marine organisms to a marine life, and to determine how and why such functional adaptations arose. Similarly, the central embryological problem concerned in marine biology is to determine what structural and functional adaptations are involved during successive stages in the life-histories of marine animals and plants, and to determine how and why these adaptations vary. Finally, the purpose of ecology, as a branch of marine biology, is to determine how marine animals and plants are related to every element of their environments, and to determine how they behave so as to maintain these relations.

Yet the belief in many quarters is that, unless the marine biologist devotes his energies toward proving or disproving some evolutional or other widely promulgated theory, his research is devoid of scientific merit. Only last summer a prominent biologist plied me with these questions: What is your study of the relation between chaetognaths and their environments contributing toward an understanding of evolution? What light is it throwing upon the hereditary process? It was clearly implied that, if I could not foresee how it would bear on some dominant theory, my research was superficial and unimportant. But does an animal do nothing important except evolve? Does the meaning and significance of life consist solely in the process by which one individual develops from another? Is it superficial and unimportant to measure the relations between organisms and their environments when *life is wholly dependent upon maintaining these relations?*

The marine biologist is not committed to investigating any phase of evolution or heredity except as it concerns the evolution and heredity of marine organisms, but he is committed, primarily, to finding out what marine organisms are—as such. Incidentally, of course, he will contribute toward a better understanding of the laws of evolution, heredity, variation, and so on, and he will aid in solving many morphological, embryological, and other problems; but only as by-products of his primary obligation—to understand marine organisms.

Broadly interpreted, this conception of marine organisms is that the significance of no phenomenon essential to the life of any marine

organism can be fully understood so long as any other phenomenon likewise essential to it is entirely ignored. This does not imply that the marine biologist must set out with a grim determination to investigate exhaustively, without rhyme or reason, every organism in the sea. Such a course would be folly indeed. But it does predicate that the point of view with which any particular problem is attacked must be so broad and comprehensive as to forestall the too frequent claim that the "ultimate" mystery of life is about to be discovered. It implies that continuous and intimately co-ordinated investigations in morphology, embryology, cytology, physiology, ecology, are required in order that headway may be made toward solving the problems of marine biology. Every problem investigated must be subordinated to this conception; each must be so defined and studied as to contribute its quota toward understanding marine organisms.

Many prominent marine biological institutions, however, regard marine organisms from a quite different point of view. Consider, for example, the Woods Hole Marine Biological Laboratory.[1] No one alive to the progress of American biology during the past three decades can fail to attribute a large part of this progress to the influence of this laboratory. Yet, strictly speaking, scarcely a single investigation carried on under its auspices has been one in *marine* biology, but rather, as Ritter (1905, p. ii) has aptly stated: in "*general biology prosecuted by researches on marine organisms.*" To quote further: "The user of marine organisms in such investigations is quite indifferent to everything concerning them that does not bear directly upon his particular problem. He puts aside the marine animal after it has served his purpose without having even noticed, perhaps, the major part of its traits and qualities and the questions concerning it." Again (p. ii) he says: "The investigator makes use of animals and plants that live in the sea in general biological researches. That these organisms happen to be marine is an incident merely. The investigator turns away from them without hesitation when others, from whatever source, come to hand that suit his purpose better." The investigator with such aims makes no attempt to understand marine organisms as such.

Perhaps the difference in point of view will be more clearly revealed by considering the aims and work of the Naples Zoological Station.

[1] There are in reality two marine biological laboratories at Woods Hole. One is locally known as the "M. B. L." and the other as the Fisheries Station. Noteworthy researches have been prosecuted at both, but these remarks relate primarily to the M. B. L.

the world's most renowned marine laboratory. Here the lines of investigation are distinctly twofold. Like the policy of the Woods Hole Laboratory, that of the Naples Station facilitates research in the widest sense, and no effort is made by the Station to influence the lines of investigation of those who occupy the "research tables." The investigator is permitted to pursue any sort of research he chooses. For example, a morphologist may study the pituitary body, hypophysis, optic chiasma, auditory vesicles, etc., of a particular species of marine fish because he believes that peculiarities in their structure will aid in understanding the origin and evolution of homologous structures in all vertebrates. His investigation, so far as concerns that particular species of fish, is restricted to a dead brain. How and why the peculiarities in structure are correlated in the living fish with other peculiarities in structure, with peculiarities in function, and with peculiarities in behavior, which all together make the fish the particular species of marine fish that it is, are questions which give no direction to his research. In short, his investigation is one in the general morphology of the brain or parts of the brain: a fresh-water fish might serve his purpose equally well. Again, a physiologist may study phosphorescence in *Gonyaulax* because he believes its unique manifestation in this plant will aid in understanding similar phenomena in all phosphorescent organisms. The fact that the uniqueness, which causes him to study the phenomenon in *Gonyaulax* rather than in a fire-fly, is correlated with other unique functions, structures, and behaviors which all together adapt this plant to a marine habitat has no effect on his investigation. His problem is phosphorescence, and the particular organism with which he deals is an incident only. Finally, a cytologist may study chromosomal behavior during spermatogenesis and oögenesis in a chaetognath because he believes that certain oddities in the monoecious nature of the animal may so effect this behavior as to aid in understanding chromosomal behavior generally. Here, again, the fact that the monoecious nature of the animal relates to an animal having structures, functions, and habits typical only of chaetognaths does not influence the investigation. The cytologist is studying the general cytology of germ cells, and the particular organism dealt with is an unavoidable incident. Similarly with respect to most other investigations. Interest is centered in the general theoretical bearing of the structures and functions investigated, and not in the organisms to which they pertain. In so far as the Naples Station has occupied itself with studies of this type it has

been devoted to researches in general biology which only incidentally contribute to marine biology.

But the Naples Station is also engaged in a second enterprise having for its object, as manifested in its magnificent monographic series *Fauna and Flora*, exhaustive knowledge of the fauna and flora of the Gulf of Naples and the Mediterranean Sea. These monographs, it is true, relate mainly, though not entirely, to the structure of the organisms but, in so far as they are taxonomic, they constitute the initial step toward understanding the organisms of the Gulf and of the Mediterranean. The natural second step must be ecological, i.e., determination of how the various species are related to their environmental complexes. Then would follow the more intensive studies of structure, function, and behavior required to understand how and why the organisms maintain these relations. Little more than the first step has been taken, for, according to Kofoid (1910, p. 20), "the Station has not as yet undertaken any systematic exploration of pelagic, abyssal, or littoral fauna, though much of the work of collection, the records of seasonal occurrence, and the individual researches thus far published afford a basis for the beginning of such enterprises." But, however limited the actual achievements may be, the Station is engaged in a programme of research having for its object complete understanding of the structure, function, and behavior of the organisms by virtue of which they are adapted to the marine environments of the Gulf of Naples and the Mediterranean Sea. When this type of investigation shall have been carried beyond the preliminary taxonomic stage, the Naples Station will be engaged *strictly* in researches in marine biology.

The two types of investigation, general biology and marine biology, are intimately related to each other. The same organisms may be dealt with and largely the same methods of study may be employed, but the point of view which gives direction to each piece of research is fundamentally different. In the former type, marine organisms are regarded as tools to be used in solving some morphological or other problem relative to land and fresh-water organisms as well. In the latter type, morphological and other methods are employed for the purpose of understanding marine organisms. Both types of investigation are indispensable. Who could justly maintain one to be necessarily more productive to biology than the other? If the purpose of biology is to fully understand organisms, it follows that general biological researches must contribute toward this end, but it also follows that investigations having for their object complete understanding of marine organisms,

fresh-water organisms, or land organisms—as such—must, by very definition, contribute toward the same end. Yet, while the value of the former type of investigation is widely appreciated, that of the latter is not.

With few noteworthy exceptions, among the foremost of which stands the Port Erin Marine Biological Station, it is not the marine biological stations but enterprises such as the Monaco Institute of Oceanography, the great oceanographic expeditions, the fisheries laboratories like the United States Fisheries Stations at Woods Hole, Massachusetts, and at Beaufort, North Carolina, and the International Commission for the Investigation of the Sea, that have contributed most to the science of marine biology. The great majority of marine biological stations are devoted to general rather than marine biology and, of course, collect their material when, where, and how it may be best obtained without regard to the problems of marine biology. They rarely trouble themselves with questions concerning the seasonal, vertical, horizontal, or topographical distribution of any species of marine plant or animal. They frankly make no attempt to determine how or why variations in the distribution of organisms are correlated with fluctuations in light, temperature, salinity, gas-content, and other elements of their environments, or of how any species is ecologically related to any other species.

It has been contended that such matters pertain only to ecology; that they involve no problems in morphology, embryology, cytology, or physiology. Is ecology, then, the major part of marine biology? Are morphology, embryology, and physiology secondary in importance? Obviously not, for no act of any organism can be fully described in terms of behavior alone, function alone, or structure alone, or even in terms of the organism alone. Every vital act is virtually a moving equation between the organism, a highly integrated system of structures and functions, and the environmental complex. *The way in which organisms are distributed with respect to each element of this environmental complex, and how they behave so as to maintain this distribution is all ecology, strictly speaking, can tell us.* Why they are so distributed and why they behave as they do are fundamentally morphological and physiological problems; problems difficult to solve, perhaps, but none the less real and significant. It must not be forgotten that every act involves an actor; that distribution and behavior imply some morpho-physiological thing which is distributed and which does the behaving. Does it not follow that a peculiar or unique distribution and behavior presupposes an equally peculiar or unique

organism which is describable only in terms of structure and function? To make this description is fully as important and essential for understanding the relations maintained between organisms and their environments as anything an ecologist—as such—can reveal.

Why is the copepod *Calanus finmarchicus* typically more abundant in the San Diego region than its near relative *Eucalanus elongatus?* Why is *Sagitta enflata* captured in the San Diego region only within ten fathoms of the surface, while *S. lyra* is seldom captured above one hundred fathoms? Why does the ctenophore *Pleurobrachia bachei* increase in abundance on the surface as the temperature of the water increases from 16° C to 20° C, and why have specimens exceeding nine millimeters in height never been taken from water exceeding 17° C, although they occur abundantly in colder water? As the temperature of the water increases between 15° C and 20° C, why are the zoöids of the sexual generation of *Salpa democratica* obtained from the surface in decreasing numbers while those of the asexual generation are obtained in increasing numbers? Such problems are as fundamentally morphological and physiological as they are ecological, but most marine biological institutions almost completely ignore them. They are admittedly outside their chosen lines of research. Yet no marine organism can be well understood until many problems such as these are solved.

What of it? What value has the fact that four hundred individuals of a particular species were obtained when the temperature of the water was 20° C, while only one hundred were obtained when it was 15° C? May it not have been a mere coincidence due to the effect of random sampling? Why, then, waste time tabulating data when they apparently concern facts of no importance in the life of the species involved?

These questions carry the subtle implication that the value of facts can be predicted in advance of their observation; that, unless the bearing of certain classes of facts upon some dominant theory can be foreseen, it is foolish to study them. Theories of evolution, heredity, variation, adaptation, and selection must, of course, be formulated before they can be proved or disproved. But nothing is more certain than that they ought to be formulated in consequence of as well as in preparation for investigations. Otherwise induction would be replaced by deduction and then no observation would be worth while unless the facts which it revealed were first deduced from theory.

But this *modus operandi* is not science. A little reflection will convince anyone that science affords no means exclusive of observation of deciding whether particular facts of nature are or are not worth observing. Searching investigation alone is capable of determining what value attaches to the fact that four hundred individuals of a particular species were obtained when the temperature was 20° C and only one hundred when it was 15° C. If it actually turns out to be a coincidence due to random sampling, investigation alone can demonstrate it. If it is important to the life of the species involved, investigation alone can demonstrate that. Is it not unscientific to pronounce any facts of nature valueless prior to their investigation? Is not the examination of facts irrespective of their bearing on any dominant theory a necessary step in any strictly scientific programme of research?

Still, if this be granted, it is evident that no one man or institution could hope to study every aspect of marine biology any more than he could of general biology. Practically, it is necessary to select small groups of problems. What, then, is the likelihood that detailed hydrographic investigations will yield profitable biological returns?

Superficially, it looks as if undue emphasis were being placed upon the environment; as if hydrography were masquerading under the name of biology. Such, indeed, is too frequently the case in many so-called ecological researches, and it is certain to be the case unless the hydrographic observations are made subordinate to the biological ones. When this caution is observed, however, hydrography becomes as indispensable as any recognized branch of biology itself for understanding marine organisms; for, obviously, a marine organism is an organism that is primarily marine. It can live only within certain limits of temperature, salinity, density, and so on, of the water. To imply, therefore, that it is a waste of time to define these limits for each species, and to determine to what particular temperatures, salinities, and densities each species is best adapted, amounts to contradicting the fact that marine organisms live. Surely, to learn how they live and what they do is as fundamental, biologically, as to learn how they are reproduced and of what they are constructed. It follows, then, that when properly subordinated to biology, hydrographic investigations yield as important biological returns as do investigations that in themselves are biological.

Therein lies the value of realizing that the true goal of marine biology is the acquisition of full and complete knowledge of every

phenomenon touching the life of every animal and every plant in the sea. Adherence to this ideal, though unattainable in a literal sense, has a sobering effect upon investigation, and gives it a definiteness and co-ordination which it may otherwise lack. The particular problems selected for investigation will then be determined entirely from the point of view of feasibility and not from that of how they may prove or disprove a dominant theory. What particular group of problems would it be most practicable to investigate at this particular time, in this particular region, and in regard to available resources and information already at hand?

The Scripps Institution looks at the matter in this way and, although not restricting itself to marine biology, its efforts have been largely spent toward gaining an understanding of the relations maintained between organisms and their natural environments. No other aspects of biology seem of greater importance at the present time, and the Institution is so situated as to make this study peculiarly practicable. But, as Ritter (1915, p. 232) says:

> The managing board have no delusions as to the uniquely "burning" character of the questions under investigation, or as to its having reached the threshold of the Ultimate Mystery of Life and Death. Its profound belief in the importance of biologic truth to the welfare of human kind is of such sort that it knows that many other problems being studied by many other men and other institutions are no less vital than those engaging its efforts; and that problems of tomorrow, next year, next decade, next century, while different from those of today, will be no less numerous and no less insistent than those of today. It holds every item of positive knowledge of the living world essential to the scientific interpretation of that world; that such interpretation alone can beget a right attitude toward that world; and that the high level of man's development which we call civilization is wholly dependent upon a right attitude on the part of the largest number possible of the community toward all things that live.

3. Field Observation vs. Laboratory Experiment

Some time ago Whitman (1902, p. 504) made this statement:

> The fundamental problems of heredity, variation, adaptation, and evolution cannot be wholly settled in the laboratory. They concern vital processes known only in living organisms—processes which are slow and cumulative in effects, expressing themselves in development, growth, life-histories, species, habits, instincts, intelligence. These problems require, therefore, to be taken to the field, the pond, the sea, the island, where the forms selected for study can be kept under natural conditions, and where the work can be continued from year to year without interruption.

Though true, says the experimentalist partisan, this is an obviously impracticable ideal; and while such problems cannot, perhaps, be "wholly settled in the laboratory," their really essential features can be satisfactorily worked out by the experimental method. Laboratory experiments have demonstrated the physiological mechanism of response involved in many reflex actions, instincts, and habits, and have greatly clarified our vision as to the probable origin of memory, reason, and other complex functions of consciousness. Indeed, the literature of animal behavior abounds in such terms as phototaxis, geotaxis, thermotaxis, and chemotaxis, all of which pay tribute to the ingenious achievements of laboratory experiments. Do not the results justify the claim that all really essential knowledge concerning the relation between marine organisms and their environments can be more accurately and much more expeditiously ascertained by subjecting a few typical organisms to laboratory experiments than by investigations prosecuted in the ocean itself? Does not the laboratory method eliminate the expense and time-consuming task of analyzing hydrographically hundreds upon hundreds of water-samples?

Experiments conducted in a laboratory are and always will be indispensable but, after all has been said, *they reveal only what transpires in a laboratory and are necessarily incapable of revealing what occurs in nature.* Whitman's ideal, though impossible of complete realization, could and would come much nearer realization than is at present the case were the indisputable fact more widely appreciated that no method of laboratory experimentation can reveal the natural behavior of an organism unless it is possible to re-create nature in miniature. Even if certain environmental conditions can be reproduced in a laboratory, the total complex cannot be duplicated. Certain stimuli occur in nature which are necessarily absent in the laboratory, and others are probably introduced in the laboratory which do not occur in nature. This is particularly true with respect to the ocean. How, for instance, could the stimuli associated with depth, distance from the coast, velocity of current, or wave action be duplicated? Moreover, the nature of an animal's response depends upon the duration as well as upon the intensity of any particular stimulus, and upon other preceeding and attendant stimuli. This fact makes it obvious that laboratory experiments can offer no reliable evidence concerning an animal's behavior in nature. Says Yerkes (1914, p. 181):

> It would appear to be self-evident, yet the attitude of many experimental students of animal behavior seem to contradict the statement, that every

student of animal life should be familiar with the objects of his interest in nature as well as in the laboratory: that he should possess, as a basis for evaluating the results of experiments, intimate knowledge of the instincts, habits, temperaments, and habitat of whatever type of organism he happens to be using for experimental purposes.

Even if the natural environment could be duplicated, another insuperable difficulty confronts the laboratory experimentalist. He is compelled to restrict his experiments to a few individuals; but he always applies his conclusions to races, varieties, species, or some other similar group of organisms. How can he be sure that the behavior of the individuals selected is typical of that of the group as a whole? He cannot, no matter how large the number of individuals experimented upon, unless he knows in considerable detail the environmental conditions at the time and place his selected individuals were collected; and unless he knows how the group as a whole is distributed with respect to variations in the environmental element he deals with in his experiments. An illustration will make this clear.

The species of chaetognatha most characteristic of the San Diego region, *Sagitta bipunctata*, increases in abundance on the surface from noon until some time after sunset, when it attains a maximum; but large numbers may occur on the surface at all times of day and night —even at noon. Is it reasonable to assume that individuals collected at noon would react in the same way to variations in light intensity as those collected after sundown? Yet the latter are most typical of the species as a whole. Again, the species decreases in abundance on the surface as the temperature increases above 15° C, but large numbers are normally present at all temperatures. Is it reasonable to assume that those collected on the surface when the temperature was 20° C would react to variations in temperature like those collected when the temperature was 15° C? Yet the latter are most typical of the species as a whole. Similar phenomena occur with respect to variations in salinity, and probably with respect to variations in gas-content, and other environmental elements.

Obviously, the magnitudes of each element of an environmental complex may act like so many sieves separating the individuals of any one species into a variety of behavior-classes. Reactions witnessed in a laboratory, therefore, may be largely due to the particular individuals collected. If this is so, intensive investigation of the organism in its natural environment is a necessary preliminary to generalizations from laboratory experiments on behavior: if it is not so, that fact must be proved in each particular case, or conclusions applied to the species (or

other taxonomic group) will be founded upon an unjustified assumption. In either case, the facts to which this assumption relates must be investigated; they cannot be argued out of existence or into existence. Science, if really scientific, must ever proceed by induction: it must observe, describe, and classify all ascertainable facts before it can justify any generalization involving those facts. For deduction unsupported by induction, "carries the implication that great numbers of facts of nature can be explained without having been themselves examined." (Ritter and Johnson, 1911, p. 432.)

The substitution of pseudo-scientific speculation for rigorous inductive method reaches its extreme, perhaps, in Ostwald's (1902) viscosity theory of vertical migration. Basing his speculations on a literal interpretation of the commonly accepted definition of plankton as "die Summe der *schwebenden* [italics mine] Wasserorganismen," which he (p. 596) holds to be "die allgemeinste und entsprechend gröbste Definition des Planktons," Ostwald develops his theory: "nicht durch Zussammenfassung von Einzelthatsachen," but "aus physikalish-chemischen Voraussetzungen und einigen sehr allegmeinen Lebenseigenschaften des Planktons." He reaches the conclusion that variations in viscosity of the water, induced mainly by diurnal and other periodic variations in temperature, cause plankton organisms to rise and fall, thus accounting for vertical migrations.

The theory is ingenious and, like many similar ones, is provided with innumerable "cubby-holes" in which the main purport of the theory may be conveniently concealed. It would consume more space than this paper permits to point out all its fundamental weaknesses. This much, however, must be said: the assumption upon which the theory rests is absurd, if literally interpreted, for organisms are not corks, and the most characteristic quality of an organism consists in its ability to live—not in its ability to float or remain in suspension. This tendency, so frequently displayed by biologists, to eliminate the organism from consideration and substitute physical and chemical processes for its activities, could not be scientifically justified even if that organism had been manufactured of physical mixtures and chemical compounds. It is precisely such substitutions that characterize Otswald's theory.

Even if variations in viscosity were the main causes of vertical migration, observation demonstrates specificity in their effects: *Sagitta bipunctata* occurs on the surface in larger numbers between 6 and 8 A.M. than at any other time between midnight and noon; *Calanus*

finmarchicus does not. Why? Obviously, no physico-chemical theory like Ostwald's can explain such facts unless, as is not infrequently the case, one selects only the facts which fit and ignores those which do not fit. "Every truly vital chemico-physical problem of organisms," says Ritter (1915, p. 231), "is two-phased: how do the chemico-physical attributes of the constituent substances act upon and so explain the organisms; and what particular structures and activities are the chemical substances caused to manifest by being constituents of and used by the particular organisms?" Specificities in the vertical migrations of *S. bipunctata* and *C. finmarchicus* can be physico-chemically accounted for only by corresponding specificities in the physico-chemical makeup of the organisms. The main value of Ostwald's theory consists in pointing out that variations in viscosity are involved in the phenomena of vertical migration. It, of course, contributes something to the explanation of these phenomena, but very little.

Laboratory experiment and field observation must go hand in hand. The former cannot, except by inference, ascertain the manner in which a species is related to its environmental complex. The latter cannot, except by inference, ascertain the nature of response involved in correlations observed between marine organisms (or any other kind of organisms) and their environments. Observation alone cannot determine whether the observed correlations are due to tropisms, trials and errors, or some indirect metabolic reactions. Experiment alone cannot reveal the fact that *Sagitta bipunctata*, for example, is usually more abundant between fifteen and thirty fathoms than at any other depth; that it decreases in abundance below this depth much more slowly than it does above it; that it maintains its maximum abundance at higher levels during the summer (July to October) than during the winter (November to March); that it decreases in abundance as the distance from the coast increases at all depths above twenty fathoms, while it increases in abundance at all depths below thirty fathoms, etc. These facts pertain to the species' behavior and have played their rôles in its evolution just as certainly and to fully as great an extent as is the case with any facts of behavior demonstrated in a laboratory. Assuredly, both sorts of investigation are required in order to approach, even remotely, complete knowledge of the behavior of any species. "That old and true method of natural history," says Whitman (1902, p. 505), "—*observation*—must ever have a large share in the study of living things. Observation, experiment, and reflection are three in one.

Together they are omnipotent; disjointed, they become impotent fetishes. The biology of today . . . has not too much laboratory, but too little of living nature."

4. Complexity of Hydrobiological Relations

On June 17, 1909, four surface hauls (p. 160, hauls 1659–1662) were made off La Jolla with the same net while the "Agassiz" was tied to its mooring. The temperature of the water was 18°.4 C during all four hauls. Yet, the first haul (5:00 to 6:00 P.M.) caught thirteen specimens of *Sagitta bipunctata,* the second (6:00 to 6:45 P.M.) caught none, the third (6:45 to 7:30 P.M.) caught 550, and the fourth (7:30 to 8:00 P.M.) caught none. Thus, the number of specimens varied erratically from none to 550, and the third haul caught about fifty-six times more per hour than the first, an increase of fifty-six hundred per cent in one hour and a half. It is evident, from the constancy in temperature, that the current, and hence the volume of water filtered, could not have varied to an extent corresponding, even roughly, to the difference in number of specimens obtained. Moreover, it is unlikely that any progressive hydrographic change associated with such a brief time interval could have caused first a decrease, then an increase, and finally another decrease in number of specimens obtained.

Someone may see in this example a demonstration that hydrographic investigations can yield little definite information concerning the relation of this species to the conditions of its environment. Does not the instance prove this species to be erratically distributed with respect to temperature and other hydrographic conditions; that the condition of the environment had nothing to do with the variability noted? On the face of the matter it seems so. Yet it is fairly well established that *Sagitta bipunctata* is definitely affected by fluctuations in the temperature of the water. On the surface it decreases in abundance, on the average, as the temperature increases above 16° C. Furthermore, every depth thus far investigated (5, 10, 15, 30, 40 and 50 fathoms) shows that the species increases in abundance as the temperature increases from 9° C to 14° C, and decreases as the temperature increases from 16° C to 21° C. In other words, the species maintains a maximum abundance when the temperature lies somewhere between 14° C and 16° C, in spite of the fact that the above instance gives no indication of it. The fact that one case apparently

contradicts this generalization really signifies that the natural variability in plankton distribution is so large that the hydro-biological relations will be masked unless large numbers of searching and fairly continuous hydrographic observations are made which correspond in time and place to net hauls. Says Herdman (1908, p. 56):

> It is clear that samples taken quarterly, monthly, or even fortnightly, are quite inadequate to convey a correct idea of the constitution and changes of the plankton of a sea-area in any detail; and, consequently, conclusions ought not to be drawn from such insufficient observations. Samples taken weekly throughout the year, and almost daily during the . . . most critical months, give by no means too much information, but will probably suffice to enable one to make that detailed comparison between adjacent localities and dates which are necessary for the purpose of determining the representative value of such periodic samples.

The complexity of hydrobiological problems is well illustrated by Herdman (1907, p. 37). On April 1, 1907, one mile north of Port Erin, Isle of Man, two "exactly similar" surface nets were towed side by side for fifteen minutes. One net (which we shall designate as A) was hauled in, emptied, and put out again at the expiration of the first eight minutes, while the other net (B) was not touched. The first half of the haul with A did not contain a single crab zoëa, but the last half contained essentially the same number as the uninterrupted haul with B did. In both there was "an extraordinary number of crab zoëas, rendering the ends of the nets quite dark in color." This is "incontrovertible evidence of the sharply defined nature of a shoal of organisms . . . [and forms] . . . an instructive example of how nets hauled under similar circumstances a short distance apart may give very different results."

In spite of the many similar instances that might be cited, there seems to be a widespread impression that one, or at most a very few hauls with a net of known filtering capacity justify conclusions concerning the number of each species present over large areas of the sea. It is not fully appreciated that the number and kind of organisms caught by any one net haul at any one depth, time, and place is consequent not only upon the volume of water filtered, but upon the temperature, salinity, gas-content, and chemical composition of the water; upon the effects of wind, clouds, fog, rain, snow, ice, light, and season; and upon many strictly biological influences, such as stage of growth, period of reproduction, food relations, and periodic activities. Though collecting apparatus be as perfect as human ingenuity can devise and the volume of water filtered be known to the smallest

fraction of a cubic millimeter, neither can obviate the necessity of making large numbers of hauls in restricted areas, and tabulating the hydrographic conditions corresponding to each.

The objection may be made that the examples cited above were cases of extreme, not typical, variability. Let us then consider certain typical instances relative to the San Diego region. When the specimens of *Sagitta bipunctata* obtained in each of twenty-five surface hauls made with a 000 net between 4 and 6 A.M. during June and July, 1908–09, are counted, the mean abundance is found to be 260 per hour, while the *mean variability*[2] is 345. Between 6 and 8 A.M. twenty-one hauls give a mean abundance of 317 and a mean variability of 448; between 8 and 10 A.M. twelve hauls give a mean abundance of 230 and a mean variability of 357; between 10 and 12 A.M. thirteen hauls give a mean abundance of 10 and a mean variability of 14; between 12 and 2 P.M. thirteen hauls give a mean abundance of 16 and a mean variability of 21; between 2 and 4 P.M. thirteen hauls give a mean abundance of 15 and a mean variability of 18; and between 4 and 6 P.M. twelve hauls give a mean abundance of 34 and a mean variability of 45. The list might be continued indefinitely, and similar data might be presented relative to copepods, schizopods, ctenophores, salps, etc. All reveal a mean variability which *nearly always exceeds the mean abundance.* Thus, in the above instance, it is 1.3 times the abundance between 4 and 6 A.M.; 1.4 between 6 and 8 A.M.; 1.5 between 8 and 10 A.M.; 1.4 between 10 and 12 A.M.; 1.3 between 12 and 2 P.M.; 1.2 between 2 and 4 P.M.; and 1.3 between 4 and 6 P.M.

The significance of these facts is obvious. The accidental error involved in a single net haul due to the natural variability in plankton distribution exceeds, on the average, the true mean abundance which the single haul attempts to measure. In other words, *if the volume of water filtered can be estimated within an error of one hundred per cent nothing can, as a rule, be gained by more accurate measurement.* Stated again, if the "filtration constant" is approximately known, and if the mean velocity of current can be estimated, say as 6 ± 6 kilometers per hour, the mean number of plankton organisms present per cubic meter of water throughout the San Diego region can be determined *just as accurately as if the "filtration constant" and velocity of current were known with the most extreme accuracy conceivable.*

[2] By mean variability is meant the average of all differences between the mean abundance and the abundance indicated by each haul. It is not equivalent to the standard deviation.

More time spent in repeating hydrobiological observations under the same controllable conditions, rather than in computing "filtration constants" and improving the accuracy of the apparatus, is the most urgent need. Not only is time wasted in needless refinement of apparatus, but, as Thorndike (1904, p. 158), says:

> Much ignorance is shown by the many students who disparage all measurements that are subject to a large variable error. They either do not know or forget that the reliability of a measure is due to the number of cases as well as to their variability, and that in the more complex and subtle . . . [phenomena] . . . it is always practicable to increase the number of measurements, but often impossible to make them less subject to variable errors. They also forget that the natural and real variability of the fact itself is often so large as to make the variability due to errors of instruments and observation practically negligible.

Once this fact is grasped it will be evident that the methods of collecting and exploring employed by most oceanographic expeditions, like the "Challenger," "Blake," "Valdivia," "Siboga," and even the German plankton expeditions, cannot reveal in any detail the relations maintained between plankton species and their environment. The methods are adequate only for determining the kinds and range of species over extensive areas and for yielding general descriptions of the associated environments. The results embodied in the numerous excellent monographs and reports, while detailed and comprehensive taxonomically, afford little, if any, reliable evidence concerning the relative abundance of the various species in their horizontal, vertical, or seasonal distribution. The methods are adequate for purposes of scientific reconnaissance, but are not adapted to yielding that detailed hydrobiological information without which the first step toward understanding the habits of any marine organism is impossible. It is evident that no institution can obtain this required information unless its efforts are primarily biological rather than oceanographical.

5. Quantitative Methods Employed at the Scripps Institutions

There are several marine institutions in Europe that recognize the necessity of quantitative investigations. Among the foremost may be mentioned the Commission for the Scientific Investigation of the German Seas, the International Commission for the Investigation of the Sea, and the Marine Biological Station at Port Erin, Isle of Man. To these we are indebted for much mathematical and experimental knowledge concerned in quantitative estimates of marine organisms, as well as for apparatus for collecting them and for analyzing the

physical and chemical conditions of the sea. The two commissions, however, especially the German one, have based nearly all their researches upon an assumption of uniformity in the distribution of the smaller organisms over large areas, and the Port Erin Station is to be credited especially with having demonstrated, very completely, the serious error involved in this assumption. Furthermore the two commissions differ radically from the Port Erin Station, in that the latter is engaged in intensive rather than extensive investigations, and recognizes the necessity of frequently repeated hydro-biological observations in very restricted localities.

The Scripps Institution has followed, in general, the lead of the Port Erin Station, but differs, perhaps most conspicuously, from all three European institutions, in that its primary interest is in pure rather than economic biology. Its methods are based on the conviction that large numbers of somewhat crude hydro-biological observations, rather than precision of apparatus and exact computations of "filtration constants," will reveal the relations maintained between organisms and their environments. After such observations are made the data are subjected to rigorous examination. Two methods of treating the field data are used; the frequency method and the abundance method.

The frequency method consists in arranging all the biological hauls in order of the magnitude of one of the environmental elements, say temperature; separating them into groups so that the temperature range in each is the same, say two degrees; and noting the hauls in any one group containing the particular species under investigation. Then, by expressing the number of these hauls as a percentage of the total number in that group, a measure of the frequency of occurrence of the species within the limits of that temperature interval is obtained. Proceeding similarly with all the other groups, the relative frequency of the species under the different temperature conditions is found. By this means variations in the frequency of the species may be quantitatively compared with fluctuations in the elements of its environmental complex, correlations between the two established, the reliability of the correlations tested by statistical methods, and conclusions of significance drawn.

The abundance method is similar in every way to the frequency method except that, instead of depending upon the mere presence and absence of the species, the specimens in each haul are counted. Consequently, the average number of specimens per unit volume of

water filtered during each haul may be computed and compared with each other. This, of course, is much more accurate and makes a more thoroughgoing statistical treatment possible.

Preliminary and supplementary to the employment of these quantitative methods, the data are examined in a more cursory manner for the purpose of ascertaining, in a general way, the degree of correspondence between the biological and hydrographic data. For example, the center of population of *Sagitta bipunctata* undergoes a seasonal oscillation from its maximum depth in winter to its minimum depth in summer. In attempting to find a corresponding oscillation in one of the environmental elements, the temperature range pertaining to this center of population was discovered to be confined to a larger and deeper depth interval in winter than in summer. Combining these two facts a single descriptive statement is obtained, namely, that the vertical oscillation of the center of population is apparently correlated with a corresponding oscillation of the temperature distribution, or "thermocline." In order to test the extent and validity of this apparent correlation recourse is had to the more rigorous methods just described.

A more detailed consideration of these methods would require more space than is available in this paper. It would involve discussing the relation between frequency and abundance, how the frequency may be standardized when the average volume of water filtered differs, and how the unit volume of water filtered is measured. It would necessitate considering the use of geometric means, coefficients of association, coefficients of preference, methods of eliminating the effects of one variable upon the others, and methods of dealing with accidental and systematic errors. It would require an explanation of why the usual methods of linear and multiple correlation, and the probable error method cannot be legitimately applied to distribution problems of the type herein considered; and it would require an explanation of the methods employed in their places. Suffice it to say, therefore, that other papers are being prepared in which all of these matters will be discussed in detail. It is hoped, however, that this brief account will give some idea of the methods employed.

6. Summary and Conclusion

In the foregoing discussion it has been shown that:

1. The function and, strictly speaking, the only function of marine biology is to understand marine organisms.

2. Broadly interpreted, this means that the significance of no phenomenon essential to the life of any marine organism can be fully understood so long as any other phenomenon likewise essential to it is entirely ignored.

3. The majority of marine biological institutions are not engaged in marine biology, but are supporting researches in general biology which only incidentally contribute to marine biology.

4. Hydrography is as indispensable as morphology, embryology, cytology, or physiology for understanding the marine organism.

5. No method of laboratory experimentation can discover an organism's behavior in nature.

6. Hydrobiological relations are too complex to be determined without searching and fairly continuous observations made in a restricted region.

7. The natural variability in the distribution of marine organisms is so great as to make errors of collecting apparatus practically negligible.

8. Only an institution primarily engaged in marine biology rather than oceanography or economic biology is in position to investigate comprehensively the hydrobiological relations of marine organisms.

It is hoped this introduction will help to make the hydrographic data and Dr. McEwen's "Summary" contained in this volume appear as interesting and indispensable to the marine biologist as to the hydrographer of this coastal region.

Transmitted March 30, 1916.

Scripps Institution for Biological Research,
La Jolla, California.

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OF THE

SCRIPPS INSTITUTION FOR BIOLOGICAL RESEARCH

OF THE

UNIVERSITY OF CALIFORNIA

1901 TO 1912

COMPILED AND ARRANGED UNDER THE SUPERVISION OF
W. E. RITTER

BY

ELLIS L. MICHAEL
Zoologist and Administrative Assistant

GEORGE F. McEWEN
Hydrographer

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HYDROGRAPHIC, PLANKTON, AND DREDGING RECORDS

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INTRODUCTION

During the past few years the data relative to the oceanic explorations of the Scripps Institution have been in almost continuous demand. Hydrographers have desired our temperature and salinity records in order to complete their researches. Investigators publishing faunistic papers based on material dredged by this institution have repeatedly requested information concerning the season, locality, depth, nature of the bottom, and other conditions under which the specimens were obtained. Finally, the plankton records have been urgently called for, particularly by those who, desiring to make quantitative ecological investigations, could not proceed at all without them. It soon became evident, therefore, that all our hydrographic, plankton, and dredging records would have to be published if we were adequately to meet these demands.

Accordingly, early in January, 1913, was begun the laborious task of compiling and arranging the data which had accumulated during the past twelve years. All the records of temperature, depth, position, date, and so on, were carefully checked, whenever possible, against the original field-notes and all the salinity determinations were twice independently computed from the original measurements. It is thus hoped that the number of occasional blunders consequent upon such a vast amount of tabulation and computation has been reduced to a minimum.

In order to make the records available from as many points of view as possible, a description of the apparatus and methods of work

is given, in addition to the tables of data. However, as most of the apparatus used prior to June, 1908, at which time the "Alexander Agassiz" began active work, has also been employed since that time while many others have been added, the descriptions apply particularly to this later period, a brief historical résumé serving in general to cover the preceeding years. Furthermore, since most of the apparatus has been completely described elsewhere, it is considered in detail only when this is demanded in the interest of clearness, while the methods of collecting, recording, and analyzing are more fully discussed because of their important bearing upon the interpretation of the tables. Finally, since an accurate interpretation depends upon a knowledge of the magnitude of the inevitable errors involved, especially in the determination of position, depth, temperature, and salinity, such errors are fully discussed under the proper headings.

The actual work at sea has involved the co-operation of many persons to whom the institution is deeply indebted. The services of most, however, are so interdependent that it would be nearly if not quite impossible to separate them and duly credit each person with the particular services rendered. But there are a few who have been so definitely connected with the work, and whose influence upon the results achieved has been so great, that they must be mentioned here.

Except for the services and ingenuity of Professor C. A. Kofoid, who had charge of most of the earlier work and to whose ability in devising mechanical appliances and skill in working out details some of our most important apparatus is due, much of the work actually accomplished would have been impossible. This is especially true of the period from 1901 to 1906 when, crippled by lack of funds, the work at sea depended entirely upon the improvising of inexpensive apparatus. Professor Kofoid was ably assisted during part of the summer of 1901 by Professor W. J. Raymond of the Physics Department of the University of California, and later in the summer of 1903 by Mr. W. T. Skilling, teacher of physics and physical geography in the State Normal School at San Diego.

Since 1908 the scientific crew has as a rule consisted of Captain W. C. Crandall, George F. McEwen, and Ellis L. Michael, who have been responsible for most of the methods of collection employed from that time to this. It is in fact due to Captain Crandall's exceptional ability in navigating and maneuvering the "Agassiz" that the magnitude of the inevitable field errors have been reduced to a minimum.

PART I

DESCRIPTION OF APPARATUS AND METHODS OF WORK

A. Events Leading to the Present Locations and Methods of Work

1. BRIEF HISTORICAL RÉSUMÉ

The ideas out of which the Scripps Institution grew had their origin in 1891, when the present scientific director of the Station was called to the newly inaugurated sub-department of biology in the University of California. It was at once noted that, while all the fields of zoology of western America had been but imperfectly cultivated, the least studied of all was the teeming life of the great ocean on whose margin the University is located. It thus came about that most of the investigations carried on by the Department of Zoology from that day to this have pertained to the life of the Pacific Ocean. As a large amount of work in systematic zoology would have to be done at the outset, efforts were made, especially during the summers, to gain a first-hand knowledge of the fauna and their habitat. Thus, in the spring of 1892, a structure, partly of wood and partly of canvas, constructed with a view to being taken to pieces and moved about, was built for use as a seaside laboratory at Pacific Grove. This summer's work, supplemented by numerous collecting trips to various points on the coast both south and north of the Golden Gate, created a desire to see more of the southern coast. Accordingly in 1893 the laboratory was re-erected on the beach at Avalon, Santa Catalina Island.

From 1894 to 1901 no organized seaside laboratory work was undertaken, but numerous collecting and observational excursions were made from time to time, covering the coast from San Diego on the south to Alaska on the north. The outcome of this extensive reconnoitering was the firm conviction shared by all that San Pedro Bay was particularly favorable for almost any sort of marine biological activity.

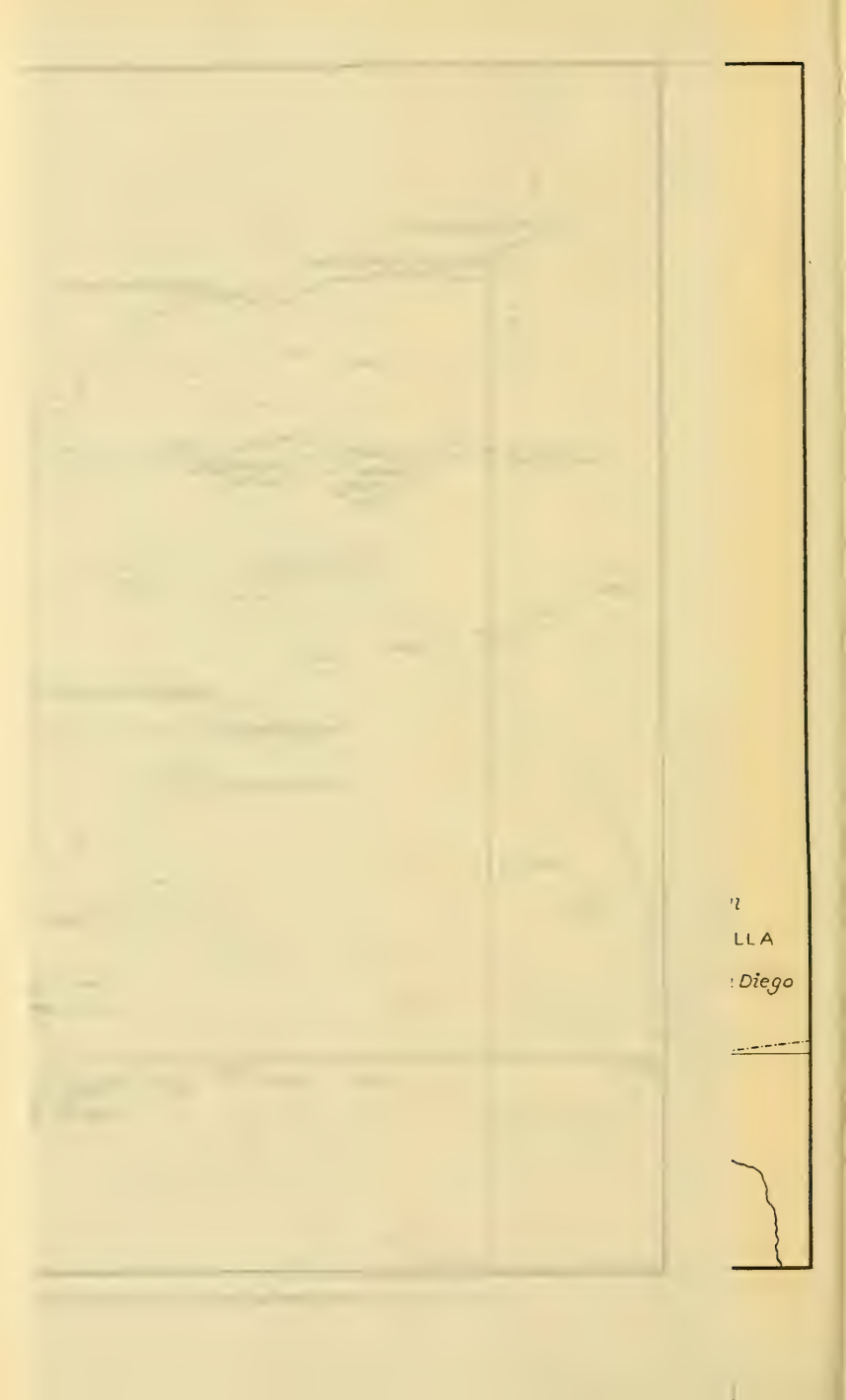
Without entering further into details (see Ritter, 1912), suffice it to say that the year 1901 marks the time when the first organized work

at sea was started. In view of the meagerness of funds, however, it was decided to limit operations to dredging and trawling in the neighborhood of San Pedro, where the laboratory was then located. An open forty-foot, fifteen horse-power gasoline launch, the "Elsie," was hired for the work. Its equipment consisted of a hand-winch for hauling the dredge and trawl, an improvised sounding-machine operated by hand and supplied with 275 meters of galvanized steel wire (no. 10 of the American Steel and Wire Company), and an improvised apparatus for taking sub-surface samples of water (see Ritter, 1902). Two months' work from May 15 to August 15 was done, during which the "Elsie" made dredgings around and in the vicinity of Santa Catalina Island and San Diego, as well as at San Pedro, the region of its main explorations. The main aim of the work being that of getting acquainted with the fauna with a view of determining the most feasible place for a permanent location, collections were not made primarily from a quantitative point of view, and the data obtained, while exceedingly valuable, have little quantitative significance.

Owing to lack of funds no explorations at sea were made during 1902, but in 1903 work was resumed with Coronado as the base of operations (Ritter, 1912). A small schooner, the "Laura," was rented and outfitted with the meager apparatus at hand, put in charge of an intelligent Portuguese fisherman, Manuel Cabral, and set to work for six weeks during June and July. The experiences of 1901 had shown that, with a limited boat equipment, bottom and plankton collecting could not be well combined and that on the whole plankton collections could be made more efficiently and no less profitably from the scientific standpoint. The apparatus consisted of a series of ordinary tow-nets of 000, 12, and 20 mesh, with which open vertical hauls were made, in addition to the usual surface towings. As the funds were insufficient to permit the purchase of closing nets, a method was improvised whereby water from any desired depth could be pumped and filtered (see p. 11). Two summers and winters were spent in telling work during the Coronado period.

After carefully studying the coast, La Jolla, a suburb of San Diego, situated fifteen miles north of the center of the city, was selected as, on the whole, the most advantageous place for the permanent location of the station, and in the summer of 1905 the laboratory was moved from Coronado to La Jolla. During the summer of 1904 Mr. E. W. Scripps had placed his pleasure yacht, the "Loma," at the disposal of the station, and in the fall of the same year he gave

Map showing the area to be surveyed. Modified from United States Coast and Geodetic Survey Chart.


LLA
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the vessel to the station. She was then taken to San Francisco, refitted and equipped with scientific gear, returning to San Diego in time for the summer's work of 1905. The "Loma" was kept in active service, making plankton and dredge collections, until she was wrecked off the lighthouse on Point Loma in July, 1906. While plans for a new boat were entered into directly, it was not until August, 1907, that the "Alexander Agassiz" was launched and not until June, 1908, that she began active work, recourse being had in the meantime to Captain Cabral and his fishing-boat, the "St. Joseph."

2. THE REGION TO BE SURVEYED

Probably the most important consideration leading to the establishment of the "station" south instead of north of San Pedro consisted in the selection and limitation of the territory to be surveyed. After careful examination (Ritter, 1905), an irregularly triangular area extending from Point Conception, 34° 27′ N, at the north to a base line extending westward from the southern boundary of the United States 32° 28′ N, bounded on the east by the coast line, and on the west by the meridian of Point Conception, 120° 25′ W, was selected. The shore line of this area, exclusive of the islands, is about 280 miles. The length of the western side is about 120 miles, and that of its southern side about 194 miles. The area, therefore, contains over 11,600 square miles. Some of the important qualifications of this area are: (1) a considerable extent of continental shelf, presenting a large diversity of bottom with numerous islands, shoals, and submarine valleys; (2) proximity to essentially oceanic conditions; (3) a climate so equable as to make it practicable to conduct investigations at almost any time during the year; and (4) a large variety of shore line readily accessible by boat or rail.

It is, of course, not to be supposed that a stone wall has been built about this area, but rather that it makes a well-defined base of operations. As a matter of fact, the southern boundary has been altered in order to include Los Coronados Islands and the Cortez Banks, at both of which places considerable work has been done. In 1908, an expedition southward as far as Guadalupe and Cerros islands was made, and, in 1912, another to the north as far as Puget Sound.

B. The "Alexander Agassiz" and Methods of Collecting

1. THE BOAT ITSELF

As plankton collecting, from the point of view of quantitative research, dates back to June, 1908, when the "Agassiz" began work, a description of the boat (see Ritter, 1912, p. 176) is here quoted:

The "Agassiz" is 85 feet long over all, is of 26-foot beam, and draws 5 feet of water. She is schooner-rigged, and as originally built was a "ketch," that is, a boat with deck area forward of the mainmast large and unencumbered, the wheel being placed behind the rear mast. Her foremast was at first 65 feet high, carrying a boom and large mainsail, and her mizzenmast 39 feet, rigged with a boom. She has a spoon bow and a 15-foot overhang. As launched the deck was without superstructures except the two-foot decking of the cabin and engine house, these being separated by a narrow passage way. Below the main deck the space was apportioned as follows: The forecastle contained the galley, the chain locker, and a 110-gallon water tank. Immediately behind the forecastle came the cabin area, divided in the middle lengthwise by the center-board box, into a captain's cabin forward on the starboard side, and a stateroom aft; and on the port side the mess cabin and lavatory. Separated from the cabins by a bulkhead is the engine room containing the two propelling engines, the main hoisting engine, and the reeling drum for the dredging cable. Behind the engine room is a lazaretto containing two distillate tanks of 460 and 230 gallons capacity and a 100-gallon gasoline tank.

The first season's work made it clear that the "Agassiz" was rigged too heavily—

that the wheel should be forward; that the scientific work should have better accommodations on the after deck; and that the galley was too small. Consequently the following year the mainmast was cut down 15 feet and reduced in diameter; both main and mizzen-sails were made lighter by changing them to the leg-of-mutton pattern; the wheel was placed in a pilot house immediately aft the mainmast; a naturalist's house was built on the deck behind the mizzenmast; and the galley was enlarged by partitioning off a portion of the messroom. These changes greatly improved the vessel not only in seaworthiness but in comfort and in facilities for scientific work. As now arranged, the "Agassiz" has sleeping accommodations for nine persons, there being two berths in the forecastle, two "Pullman" berths in the messroom, two berths in the stateroom, one in the captain's room, and two in the engine room.

The twin driving engines are gasoline, 30 horse-power each, and were built by the Western Standard Engine Company of San Francisco. The main hoisting engine is a five horse-power gasoline built by the Union Gas Engine Company of San Francisco. The large reeling drum and its spooling apparatus were designed by Mr. T. W. Ransom of San Francisco, a mechanical engineer, and were built by the Union Gas Engine Company.

These three engines and the drum are in the engine room. The drum is built in two sections, the larger of which accommodates 2200 meters of ⅜-inch hemp-steel cable for dredging and other heavy work, while the smaller accommodates 2000 meters of 3 mm. 28-strand galvanized wire for operating the lighter apparatus. In addition, a patent Thompson sounding machine, supplied with 2200 meters of $^{9}/_{10}$ mm. piano wire, is located aft of the naturalist's house and arranged so as to be run by a friction wheel on the flywheel of the main hoisting engine.

All scientific work requiring engine power is done aft. The sounding-wire is paid out on the port side and is independent of the collecting gear, so that soundings may be taken while other work is in progress. The collecting cables are passed from the drum through a runway onto the deck, over a recording meter-wheel, thence to the boom of the mizzenmast, and finally over the stern to the water line. This arrangement has the advantage of bringing together the scientific gear and the naturalist's quarters on the rear deck where there is most available space. Nearly all the work is done while the vessel is adrift, or at a standstill.

2. THE COLLECTING APPARATUS

(*a*) *The surface nets.*—These are all simple conical tow-nets consisting of a bronze rim to which is attached a head-piece of impervious cloth, like butcher's linen or canvas. This head-piece serves as a support and means of attachment for the netting proper, which may be of a variety of meshes. The upper end of the netting is securely sewed onto the head-piece and the lower end onto a foot-piece consisting of similar impervious cloth, to which the net bucket is attached. The nature of the bucket varies somewhat with the size of the net, bronze buckets being used with larger ones (000, and 000 c) while an ordinary four-ounce pomade bottle has proven the most satisfactory for the smaller nets. To provide a proper support for the netting, three ropes attached to the rim at equal distances from each other are carried backward and attached to the bucket, and also forward for about three feet where they are brought together and tied.

It is usually customary to operate three surface nets at the same time. One of the larger nets (000 or 000 c) is fastened to the end of a suitable rope about 200 feet long and to its rim is attached an air-tight five-gallon can or carboy to serve as a float. The net is then

thrown over the rail at either side of the boat's stern, depending upon the direction of drift. At a distance of about fifteen feet the next smaller net (8, 9, 10, or 12) is attached to the rope, and fifteen feet from that one the third net (usually no. 20) is likewise attached. The nets are then allowed to drift away until the rope becomes taut, when it is made secure. After a haul of the desired duration has been made, the nets are brought on board, carefully washed with surface water to prevent the organisms from adhering to the netting and being thereby carried over into the next haul, and the contents of the bucket are transfered into containers such as pint, quart, or two-quart "sure-seal" fruit jars, or, if the catch is unusually large, into pails. The catch is then preserved by adding formalin enough to make a ten per cent solution, labelled, and temporarily filed in the naturalist's house in racks specially constructed for that purpose. About five minutes are consumed in hauling-in, washing, transfering, preserving, labelling, and filing the catch, and putting the nets out again.

(*b*) *The Nansen closing-nets.*[1]—To operate one of these nets requires the combined labor of an engineer, a man to stand by the bells and read the meter, and two sailors to handle the net itself. When the net is ready to be lowered, the ring from which it is suspended is fastened to the trip which has previously been made secure to the cable and the engineer is signalled to lower. When the net has descended far enough, say 100 meters, the net is immediately raised at a uniform rate of approximately 60 cm. per second until, say, the fifty-meter level is reached. The sailors then send the messenger which, striking the trip, closes the net. A vertical haul has thus been made from one hundred to fifty meters, and the net is hoisted on deck as quickly as possible. It is then thoroughly washed with water filtered through netting of finer mesh than that of the net, thereby preventing contamination by surface organisms. After washing, the catch is transfered to containers and cared for as in the case of the surface nets and, while one sailor is transfering the catch, the other removes the messenger and adjusts the net for the next haul. About one minute elapses between the time the net reaches the deck and its descent for the next haul.

From June 19, 1909, when the Nansen nets were first put into commission, to February 17, 1910, when they were first used for vertical hauling, the only cable with which the "Agassiz" was equipped was too large to carry the messengers and trips. An arrangement

[1] For a description of this net see Herdman, Scott, and Dakin, 1910, p. 337.

was therefore effected whereby they could be temporarily used for horizontal sub-surface towing. This was done by employing two ropes, one being tied into the ring supporting the net and the other to the trip-cord. The net, being weighted so as to assume a horizontal position, was lowered and raised by means of the rope attached to the trip-cord, which thus being taut kept the net closed. After lowering to the desired depth the trip-cord rope was allowed to sag while the rope tied into the ring was made taut and tied. The motion of the net through the water caused it to open and thus a horizontal closing-net haul was made. This method, however, was very awkward and involved such a quantity of rope that it became impossible to make hauls below one hundred fathoms. Moreover, the depth error was so large that hauls could be made with satisfaction only when the sea was very quiet.

(*c*) *The Kofoid closing-net.*—This net was put into commission June 21, 1908. It is operated in much the same manner as the Nansen nets, although its great weight requires the large ⅜-inch cable and makes the handling more difficult and quite impossible in rough weather. Being constructed to make horizontal instead of vertical hauls, two messengers are used, the first to open and the second to close the net. Owing to its weight, the net tends to act as a sea-anchor which, while insuring a great accuracy in depth, makes it necessary to steam ahead slowly with one engine while making the catch. For a full description of this net see Kofoid, 1911a.

(*d*) *The sub-surface pump.*—During 1903 a pumping outfit was used for collecting microplankton from below the surface. This consisted of a semi-rotary clock pump of half-inch intake fitted to one hundred fathoms of half-inch white rubber hose. The hose was in fifty-foot sections connected together with screw couplings. It was lowered and raised by means of an improvised drum operated by hand. The water thus obtained was filtered through filter-paper, no. 20 or no. 12 netting or, after settling, it was decanted. Pumping was usually continued for five minutes when, if working at full capacity (eight liters per minute), forty liters of water would have been obtained. The small volume of water thus obtained, however, made the results unsatisfactory, and, after a thorough trial, the method was discontinued.

(*e*) *The Kofoid water bottle.*—This bottle, having a capacity of 20 liters, has been used for making microplankton collections as well as for obtaining water samples (see Kofoid, 1905; for improved model

see Kofoid, 1911b). It can be used only on the large cable. When lowered to the desired depth the bottle is closed by means of a messenger, after which it is raised on deck and the temperature is taken (see p. 14). Except during July, 1912, this method of obtaining water samples for plankton work has been seldom used since July 16, 1910, at which time the Ekman bottles were first put into commission.

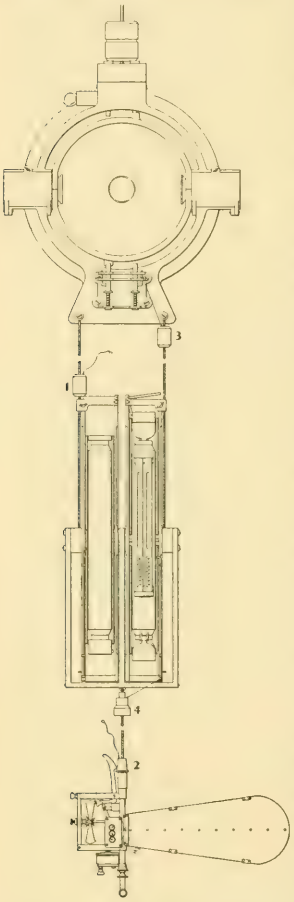

Fig. 1. A combination apparatus: Kofoid closing net, Ekman water bottles, and Ekman current meter.

(*f*) *The Ekman reversing water bottles.*—These bottles are so constructed (see Ekman, 1905a) that several of them may be clamped to the same cable and a series of depths explored at the same time. After they are lowered to the desired depths, the bottles are allowed to remain open for from two to three minutes to insure the setting of the thermometers (see p. 16). A messenger is then sent, which descending at the rate of two and one-half meters per second, reverses and closes the uppermost bottle, thereby freeing a second messenger which reverses the second bottle, and so on. After all have been closed, which can usually be detected by feeling the cable, the cable is raised until the uppermost bottle reaches the deck. This is then detached and handed over to the hydrographer, who notes the temperature and places the bottle in a specially made rack which allows the water to run out into a container (see p. 17). By this means, as soon as the water has been removed from the terminal bottle, everything is in

readiness for a second series. The Richter self-registering deep-sea thermometers (see p. 15) have been exclusively used in connection with these water bottles.

(*g*) *A combination apparatus.*—During July, 1912, a method was devised whereby two Ekman bottles and an Ekman current-meter (Ekman, 1905b) were suspended below the Kofoid net, as indicated in the accompanying figure. Upon the opening of the net a messenger, *1*, is freed, causing the reversal of one of the bottles which, in reversing, frees a second messenger, *2*, thereby starting the current-meter. Upon closure of the net another messenger, *3*, is released, which causes the reversal of the second water bottle, which in turn frees a fourth messenger, *4*, thereby stopping the current-meter. With this combination it was possible to obtain two water samples, one at the beginning and one at the end of each net haul. In addition the current-meter registers the distance of the haul or, more properly, the number of meters of water through which the net passes during the interval of its haul. While this method is somewhat awkward, the value of the collections was increased many times, and the results proved very satisfactory.

(*h*) *Other apparatus.*—Under this heading a variety of trawling and dredging apparatus might be described. However, since 1908, such apparatus has been too seldom used to justify taking the space here to describe it, while prior to that year the particular kind of trawl or dredge used was seldom recorded. Suffice it to say that, in addition to the apparatus above described, the "Agassiz" is well equipped with various trawls and dredges, ranging in size from the four-foot Tanner trawl to a fifty-foot Otter trawl.

3. COLLECTION OF WATER SAMPLES AND MEASUREMENT OF TEMPERATURE

(*a*) *Surface samples.*—It has been our custom since 1908 to collect surface water samples at intervals varying from ten to twenty minutes when the "Agassiz" is under way. The average speed of the boat being seven and one-half knots per hour, samples are thus obtained at intervals varying from one to three knots, in addition to those usually taken in connection with surface-net hauls. A canvas bucket having a capacity of about two gallons is used to dip up the water, after which a thermometer (manufactured by L. Steger, Kiel) reading directly to two-tenths of a degree C is immediately immersed. Two

or three minutes later the thermometer is read and the temperature estimated to the nearest 0.05 C. Owing to the fact that the scale of these thermometers is made of paper so graduated that 0.2 of a degree is represented by a distance of only 0.71 mm., it is evident that estimates closer than 0.05 would be unreliable. After reading the temperature, a pint of water is tightly sealed in a "sure-seal" fruit jar, properly labelled, and filed in the naturalist's house until it can be taken to the laboratory and analysed. In making the final record of the temperatures the readings are corrected from a table of calibration errors previously obtained by comparing the thermometer with a standard from the "Reichsanstalt."

(*b*) *Sub-surface samples.*—Prior to July 16, 1910, all the sub-surface samples were collected with the Kofoid water bottle (see p. 11). The temperatures were taken with the same thermometers and the samples were labelled, preserved, and filed as in the case of the surface samples. However, owing to the fact that the Kofoid bottle is made of bronze and is not insulated, the friction of the surrounding water on the bottle as it is being hauled up, in addition to the conduction while in the upper layers of water, appreciably increases the temperature of the enclosed sample. In fact, observations show that the water in the top may be from two to three degrees warmer than that in the bottom of the bottle, when the samples are obtained from depths exceeding three hundred meters. For this reason the temperature of the water in the bottom of this bottle was always taken.

During July, 1912, several series of parallel temperature measurements were made, one set by the above method, and the other with the Ekman reversing water bottles provided with Richter reversing thermometers (see p. 15). From a comparison of the results the effect of the friction and conduction above mentioned was ascertained and a correction for the same relative to depths less than 350 meters was computed. No reliable correction could be made for greater depths, owing to the fact that the increase in temperature due to the extra friction and conduction is almost, if not quite, balanced by the decrease in temperature due to the increase in depth. The following list of corrections shows the amount by which the temperatures of the Kofoid bottle must be decreased in order to obtain the actual temperatures at the depths of closure:

Degrees C to be subtracted from reading	Corresponding depth in meters
0.00–0.05 C	0– 25
0.10	30
0.15	32
0.20	34
0.25	36
0.30	40
0.35	46
0.40	57
0.45	72
0.50	87
0.55	103
0.60	120
0.65	138
0.70	156
0.75	174
0.80	193
0.85	216
0.90	247
0.95	300
1.00	350

After this correction has been applied, the temperature may be considered accurate to within 0°2 C providing the temperature of the water in the lowest part of the bottle is taken. As stated above, this has always been done since 1908.

Since July 16, 1910, most all sub-surface samples were collected with the Ekman bottles (see p. 12) and the temperatures were measured with the Richter reversing thermometers, two usually having been attached to each bottle.

The Richter thermometer in reality consists of two thermometers, *r* and *a*, fastened together and hermetically sealed in a heavy glass tube, thereby preventing the mercury bulbs from being affected by the water pressure. In one of the thermometers, *r*, the capillary tube is contracted just above the large bulb, *B*, so that, when inverted, the column of mercury in the stem breaks at this contraction, *c*, and, dropping, fills a smaller bulb, *b*, and a portion of the stem. The actual volume of mercury thus broken off depends upon the temperature at the depth of reversal, and the scale while arranged with the lowest values at the small bulb, *b*, is graduated with respect to the large bulb, *B*, so that a direct reading is possible only when the thermometer is read at exactly the same temperature as that at the depth of reversal. Since this condition is seldom if ever realized, the reading must be

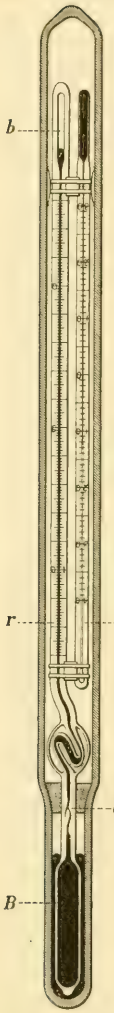

Fig. 2. Richter's reversing thermometer.

corrected for the error thus introduced. It is for this purpose that the auxilliary thermometer, *a*, is provided. Its use depends upon the fact that, being an ordinary thermometer, any one of its degree-scale divisions always corresponds to the change in the volume of mercury produced by a change of 1° C in temperature, while each degree-scale division of the reversing thermometer corresponds to the change in the volume of the total amount of mercury produced by a change of 1° C but not to that of the small fraction of the column broken off when inverted. Thus, the two thermometers, *r* and *a*, will give identical readings only at the temperature at which the instrument is reversed and the difference between their respective readings at any other temperature will be proportional to the difference between this temperature and that at the time of reversal. Hence, by reading both thermometers simultaneously the temperature at the depth of reversal may be computed. Without going further into details, it may be shown that the necessary correction, *k*, is given by the formula,

$$k = \frac{(T-t)\left(\frac{v}{s}+T\right)}{6300}.$$

where T is the reading of the reversing thermometer, t that of the auxillary thermometer, v the volume of the small bulb of the reversing thermometer, s the volume of one degree-scale division of the reversing thermometer, and 6300 a constant depending upon the coefficient of expansion of mercury and the nature of the glass.

Ekman (1905a) experimented on the time required for the Richter thermometer to assume the temperature of the surrounding water. He gave the thermometer a high initial temperature and then reversed it in water 10° C colder. Conduction proved to be very rapid on account of the fact that the large bulb is immersed in a jacket of mercury. The thermometer assumed the temperature of the water within an error

of 1° C in the course of half a minute, within 0°.1 in one minute, within 0°.02 in two and one-half minutes, and within an error of a few thousandths of a degree in five minutes. As the thermometer will gradually approach the final reading while lowered, it is our custom to wait another two or three minutes, depending upon the depth, before reversing the instrument, thus insuring an accuracy of about 0°.01 C. We have, however, read the thermometer directly without employing a microscope so that our error is somewhat larger, varying between 0°.01 and 0°.03 C.

The water samples obtained with the Ekman bottles are nearly always preserved in green glass bottles having a volume of 250 c.c., and provided with a patent china stopper fitted with a suitable india-rubber washer. A small lever of stiff wire is used to press the stopper firmly into the neck of the bottle. These bottles were purchased from the Central Laboratory of the International Commission at Christiania, and are in general use throughout the world. They have proven exceedingly satisfactory both as regards ease of handling and transportation and as an almost perfect means of preventing evaporation (see p. 25).

4. METHOD OF RECORDING

Since 1908, when the "Agassiz" began work, no pains have been spared to make our system of recording of the highest efficiency. With this end in view a double-entry plan was adopted and is still in use. After the hauls and water samples are transfered to containers, the recorder labels each one. For this purpose he is provided with haul and water sample books consisting of tags about 1½ inches square made of the best linen paper. Printed along the left-hand margin of each tag are the following items:

Haul tag-book	*Water sample tag-book*
Haul no.	Water sample no.
Apparatus	Haul no.
Date and time	Date and time
Position	Position
Depth	Depth
Bottom	Temperature
Water sample no.	

The recorder enters on each tag the information called for, using a soft lead pencil except in case of haul (and water sample) numbers; these being recorded in sequence irrespective of the nature of the haul

(or water sample), are written in India ink previous to sailing. However, to provide against loss of tags, a few tag-books are carried in duplicate in which these numbers are not entered. When the particular tag is properly filled out it is placed inside the jar containing the haul or water sample, and the latter is then filed until the "Agassiz" reaches home.

In addition to the tags a log-book is kept in which is also entered the same data for each haul and water sample, together with the details of operating the apparatus, accidents, weather conditions, and in fact anything that might have the remotest bearing upon the collections.

Upon completion of the day's work the recorder checks the entries in his log-book against those the captain has kept, adding the sextant bearings and other remarks relative to the day's navigation. As soon as possible after the material reaches the laboratory the hauls are condensed into four-ounce pomade bottles, and filed, the salinities of the water samples are determined (see p. 28), and the data are arranged in final form and typewritten, usually in triplicate.

C. Errors in Field Observations

1. Errors due to position

(*a*) *Latitude and longitude.*—Three methods are used for determining the latitude and longitude at which collections are made, all of which are subject to errors varying in magnitude consequent on a variety of conditions. The sextant method, being the most accurate, is always used when practicable. Otherwise the position is ascertained by a pelorus or, when the use of this instrument is impracticable, recourse is had to the less accurate method of "dead-reckoning." i.e., of calculating the position from course and log.

Location by the *sextant* as used by us consists of the selection of three prominent points on land, and the measurement of two angles, one between the horizontal lines connecting the observer with the central and left-hand points; the second between the lines connecting the observer with the right-hand and central points. Whenever possible, choice is made of prominent and sharply defined headlands or other salient points which can readily be identified on the United States Coast and Geodetic Survey charts. Care is taken to avoid the selection of points lying on or near a circle passing through the observer, for under such conditions the location is indeterminate.

Assuming the sextant to be properly adjusted, the following sources of error are important:

1. Difficulty in identifying the points of bearing with those on the charts. This difficulty arises from variation in their appearance due to different positions of the observer.

2. Difficulty in clearly distinguishing the points because of the hazy condition of the atmosphere.

3. Impossibility of measuring both angles simultaneously, which introduces error because of the drifting of the boat.

Experience gained through repeated use of the same three points of bearing may reduce the first source of error sufficiently to make its effect negligible. This is especially true of our work in the region about Los Coronados Islands, where the error arising from the other two sources is estimated by Captain Crandall to have varied between 0.05 and 0.3 miles, depending largely upon the condition of the atmosphere and the distance from the islands.

The *pelorus* consists of a circular plate mounted horizontally in gimballs and placed at some point on board ship affording a clear view for taking bearings. Revolving about the center of the plate are: (1) a dumb compass card, usually engraved on metal, whose face is level with the raised periphery of the plate, on which score lines are marked indicating true directions from its center parallel and perpendicular to the keel of the ship; (2) a pivoted horizontal bar carrying at its extremities a pair of sight vanes so arranged that the line of sight always passes through the vertical axis of the pelorus, and having an index showing the point at which the line of sight cuts the dumb compass.

In using the pelorus to determine the location of the boat a definite course is held. The instrument is then set on a line parallel with the ship's keel and the sight vanes are arranged so as to give the compass-bearing on first one point of land and then upon a second and, as a check, upon as many more points as may be desired.

Aside from the error due to faulty identification of the points of land with those on the charts, large errors are due to the following causes:

1. Difficulty of holding the boat on the same course, without making too great headway, while the sight vanes are set successively upon the points of bearing.

2. Difficulty of getting clear sights while the boat is rocking and pitching.

3. The distance the boat moves while the observations are being taken.

In a quiet sea the pelorus gives fairly accurate results but, when rough, the error may be very large. For this reason it is seldom used, except for checking against sextant observations, unless atmospheric conditions make the use of the sextant impossible. Positions determined by it may be considered accurate within 0.3 to 0.5 miles.

Dead-reckoning is used only when all other methods are impracticable; namely, during fog, or at night, or when the distance from land is so great as to render points of bearing invisible. The method consists in measuring the speed of the boat along its course by means of a log-line. It involves large errors resulting from the following causes:

1. Difficulty in accurately determining the departure point, such as the extreme edge of a kelp bed.

2. Difficulty of holding the boat on the desired course, which varies with the "sea" as well as the skill of the pilot.

3. Drift and leeway due to currents, direction of wind and sea, and velocity of wind and sea, all of which alter the course of the boat and cause the log-line to over or under-read.

4. Deviation in accuracy of the compass, depending upon number and position of anchors and other magnetic materials.

The latter error is reduced to a minimum by "swinging the ship" and making our corrections for each heading, but the effect of the other errors is such that their magnitude increases with the distance covered by the boat. Care is taken, however, to "check back" after reaching port or anchorage in order to correct the courses and distances registered in the captain's log-book. With the utmost care, however, an error of one mile in position sometimes occurs.

Finally, each of the above methods is used as a check against the others. In addition soundings when made are always compared with the entries on the charts and the position thus determined is checked against that derived by the three methods above described. In this way the average error in latitude and longitude, relative especially to our work since 1908, was reduced to 0.3 miles, although in some instances the error is upwards of one mile (see p. 45).

(*b*) *Depth.*—All our determinations of depth depend upon a meter-wheel which registers the amount of cable paid out. It is obvious, therefore, that unless the cable be perpendicular, the registration will exceed the depth. In order to measure the error due to such inclina-

tion, Brenneck made a number of experiments during the "Planet" expedition (see Helland-Hansen, 1911–12, p. 7), which resulted in the discovery that, when the inclination from the perpendicular was less than 30°, the error was less than three per cent of the depth. By manoeuvering the "Agassiz" we are usually able to maintain the cable within an angle of 15°, which corresponds to an error of less than two per cent. In most cases when the inclination exceeded 30° the collections were not kept, and in those few instances where they were kept the error is noted in the tables.

By comparing all the temperatures and salinities relative to each depth investigated above two hundred meters we discovered a magnitude of variation exceeding that which would be expected from a depth error of only two per cent. It would, therefore, seem that the same angle of inclination produces an increasing relative error as the depth decreases from two hundred meters. On the other hand, it is certain that the temperature and salinity changes much more rapidly in the shallower than in the deeper water. Furthermore, the effect of drift and current in causing the inclination of the cable is less during work in the upper levels, and the manœuvering of the boat is much simpler. All things considered, the depth error probably does not greatly exceed two per cent in any case. While this conclusion applies to both soundings and intermediate depths, an additional source of error, applicable to the latter only, arises from the occasional failure of the water bottles to close before beginning to reel in the cable. In such instances the temperature reading usually indicates the failure immediately, in which event the haul is repeated. In order to detect such occurrences which escaped notice on the boat, all the temperatures and salinities relative to each depth investigated were compared and, when *both* agreed with those from higher levels, it was assumed that the apparatus failed to close at the proper depth. As such data, on account of their misleading nature, are either excluded from tabulation or questioned, the error in depth relative to the data published may be attributed entirely to that arising from inclination of the cable.

2. ERRORS DUE TO APPARATUS

It will be readily admitted that it is impossible to construct any piece of apparatus for the exploration of the sea that can be depended upon to work perfectly every time. On the other hand, we doubt if

anyone, who has not been in actual charge of such work, could anticipate the extent to which trouble is nearly always encountered. In some instances the source of trouble is apparent, in others it is very obscure, while in still others it remains an unsolved mystery. In the first category may be noted that, after a haul has been made with the Kofoid water bottle from depths exceeding three hundred meters, the temperature of the water in the upper part of the bottle differs by two or three degrees from that in the lower part, thus causing considerable trouble in determining the correct temperature (see p. 14). In the last category may be mentioned cases in which a Richter thermometer suddenly balks and, like a stubborn donkey, absolutely refuses to work until it has had its rest. Most of this trouble, however, does not lead to error and has little bearing upon the reliability of the data, but some of it relative to hauls made with the Kofoid and Nansen nets as well as to the preservation of water samples does lead to error and must, therefore, be discussed.

(*a*) *The Kofoid net.*—In using this net one is at times struck by the almost total absence of organisms obtained during a particular haul. In some such instances it has been found that the spring of the opening jaw had broken or slipped so that the first messenger failed to open the net and the second reversed both jaws at the same time. In other instances the net when thoroughly tested on deck operated perfectly, the presumption therefore being that it failed to capture anything because there were no organisms to be captured. During July, 1912, a method was devised (see p. 13) by which an Ekman current meter could be suspended below the Kofoid net in such a way that it would be started when the net opened and stopped when it closed. With such a combination it is clear that, if any time elapsed between the opening and closing of the net, the current meter would show a registration and thus a definite means was at hand for determining whether or not the net could actually be open and filtering water without catching any organisms.

A large number of hauls were made with this apparatus, distributed in depth from the surface to 550 meters, with the result: (1) that no instance came to light in which there was an absence of organisms combined with a current-meter registration; and, (2) that in a number of cases the current meter failed to register, thereby showing that no haul had been made. These facts forcibly indicate that the net, when properly opened, may be depended upon to make its capture and, consequently, whenever an "empty haul" is discovered, it may be

concluded that the net has opened and closed at the same time even though, when thoroughly examined and tested, the net seems to work perfectly and the cause of its failure to open in that particular case cannot be discovered.

Should the reader think it to be a simple matter to discover the cause for such failure, his attention is called to the following list of causes which were discovered during the work of July, 1912, some being easily ascertained while others, like 2, 4, and 6 were exceedingly baffling:

1. Tension of opening spring insufficient to open the net when submerged, although it will do so on deck.

2. Tension of spring so great that impact of the first messenger, when falling through water, is not sufficient to operate the trip, but when augmented by that of the second messenger would cause tripping of both jaws.

3. Spring of opening jaw loose or broken.

4. First messenger slightly worn along one side so that, when striking in a certain way, it slips past the opening trip, and the second messenger then trips both jaws.

5. First messenger slightly flattened and spread in consequence of repeated use so that, with a cable slightly inclined in the right direction, it strikes and operates both trips.

6. First messenger, in descending, scrapes tar off the cable which becomes jammed in the groove of the messenger, thus retarding its descent so that it does not strike with sufficient force. Impact of second messenger then trips both jaws.

7. Three cases in which the cause was not any of the above six, and could not be ascertained.

(*b*) *The Nansen nets.*—Any one having occasion to work over our plankton collections from a quantitative point of view will discover that some vertical hauls made with these nets reveal an absence of certain organisms at depths where, judging from hauls made with horizontal closing nets, an abundance would be expected. The general impression produced is that, for some reason or other, the Nansen nets act in an erratic manner, frequently, though not always, failing to capture such organisms even though they may have been abundant. While this has not, as yet, been proven, it is advisable to point out how such erratic action might arise.

The "Agassiz's" excessive stern overhang, while of undoubted advantage in protecting the collecting apparatus from the propeller-

blades, permits the waves to strike with sufficient force, in a moderately rough sea, to lift the stern entirely out of the water. Even when fairly quiet, considerable surging is caused in this manner. Now, if such a surge occurs after a haul has been made, say from fifty to twenty-five meters and the net is at rest awaiting the descent of the messenger, it is clear that the net will be lowered very suddenly, sometimes as much as eight or ten feet. Virtually, therefore, a current of water passes upwards through the net which, while of brief duration, has a comparatively high velocity. Assuming that it takes two seconds for the boat to drop say six feet from the crest to the trough of the sea, a temporary current of about three feet per second would thus be generated which, if flowing horizontally, would be capable of transporting stones the size of hens' eggs. When one considers that, though the lifting power of such a current is much less than the transporting power of its horizontal equivalent, the specific gravity of most plankton organisms being only slightly greater than that of sea-water, it is at once evident that such a vertical current has more than sufficient lifting power to throw out everything that the net might catch.

However, the extent of such expulsion would vary with a number of conditions. In the first place, it would depend upon the height of the sea for, if any of the organisms were in the net-bucket, the momentary effect of the surge would be insufficient to lift them above the rim unless the net dropped a distance at least equal to its own altitude. Secondly, the large surges occur only when the waves follow each other and strike the boat in a particular way. Thirdly, violent surging might occur but would have little or no effect unless it happened while the messenger was making its descent. Fourthly, as the depth of haul increases, the effect of surging decreases because of the inertia of the cable which tends to respond by sagging, so that below a certain depth the cable would be straightened out before the surge could effect the net. Finally, those organisms would be expelled first whose exposed surface was relatively large or whose specific gravity was relatively small, so that a comparatively slight surge might have a selective effect in expelling certain organisms while not affecting others. It is thus evident that, if expulsion occurs at all, it must be very erratic, and probably selective in its effect.

As stated above, we have as yet no definite proof that such expulsion occurs. One fact, however, pointing in this direction is that open vertical hauls, say from fifty meters to the surface, usually (but not always) catch many more organisms than an equivalent series of

closing-net hauls made with the same net from 50 to 40, 40 to 30, 30 to 20, 20 to 10, and 10 meters to the surface.

(*c*) *Preservation of water samples.*—Troublesome errors in salinity often result from the manner in which water samples are preserved. In fact, if the samples are not tested soon after being collected, abnormally high salinities will occasionally occur despite the utmost care in sealing the containers. While the amount of evaporation has, in some cases been great enough to be detected readily, it has generally been so slight as to require a special examination of all our salinities for its detection.

Such an examination has shown that the density *in situ*, $S\frac{t^\circ}{4^\circ}$, relative to water samples collected at approximately the same time from a series of depths, nearly always increases but never decreases as the depth increases. This accords with the experience of Makaroff (1904, p. 139) who says: "Les poids spécifiques doivent augmenter avec la profondeur; s'il arrivait que le poids spécifique $S\frac{t^\circ}{4^\circ}$ de l'eau de profondeur était inférieur à celui qui serait observé dans les couches supérieurs, on pourrait en déduire l'existence d'une erreur dans la détermination du poids spécifique."

This empirical relation of densities *in situ*, which Makaroff and others, as well as ourselves, have found by observation, has also a theoretical basis. Stability of the water layers could not otherwise exist.

The actual density of a mass of water at any depth depends upon its temperature and pressure, as well as upon its salinity, the relation, of course, being such that the density decreases with a reduction in pressure and increases with a reduction in temperature. Now, when, owing to instability, a mass of water at any level *a* rises to a higher level *b*, its density changes. The expansion of the water mass due to the reduction in pressure directly decreases its density but, as it also slightly decreases its temperature, the actual decrease in density is not quite so great as it otherwise would be. However, since the reduction in temperature due to an ascent of even five hundred meters is less than 0°.05 C. and the corresponding increase in density less than 0.00002, while the decrease in density directly caused by the expansion is 150 times greater, only the latter effect need be considered. Now, while the density of the rising mass of water is being continuously reduced owing to the decrease in pressure, both diffusion and conduction

tend to make its density equal to that of the surrounding water, and it will continue to rise until this condition is realized. Suppose this to occur at the level *b;* then, owing to the effect of diffusion and conduction, its density when at *a* must have been less than its density after it reached *b* by an amount exceeding the decrease in its density caused by the difference in pressure between the two levels *a* and *b*. In other words, if the densities at the levels *a* and *b* be referred to a common pressure, the former must be less than the latter or else the mass of water could not rise, whence the densities *in situ*, which are those at the two levels referred to atmospheric pressure, must be related to each other in the same way. Hence, it follows that a progressive increase of the densities *in situ* with increasing depth is the necessary condition of stability.

We have therefore used this relation, supplemented by the fact that our observations have never revealed a "reversal" in temperature, as a criterion for detecting errors in salinity due to evaporation as well as to blunders in computation. In some instances, however, this criterion was insufficient for, though it revealed an impossible relation between the densities *in situ,* it failed to indicate which particular salinity determinations were erroneous. In order to isolate these, each salinity determination was compared with the average and extreme values for the corresponding depth, month, and general locality. All the erroneous values thus detected are either excluded from tabulation or questioned, depending upon the certainty with which the values could be entirely attributed to evaporation and blunders in computation.

D. Analysis of Sea-Water

1. General properties of sea-water and measurements of salinity

(*a*) *Composition of sea-water.*—Sea-water is a dilute solution of various solid chemical compounds or salts. The weight of these salts in a thousand grams of sea-water is called its salinity and is commonly denoted by the symbol $S\,{}^{0}/_{00}$. A large number of observations have shown that, while the salinity varies widely, the proportion of each dissolved salt to all the others is nearly the same. The following list (see Krümmel, 1907, p. 219) gives the amount of each salt and its proportion to the total in a sample of sea-water whose salinity is 35.00.

Salt	Grams per 1000 of sea water	per cent of the total
$NaCl$	27.213	77.758
$MgCl_2$	3.807	10.875
$MgSO_4$	1.658	4.737
$CaSO_4$	1.260	3.600
K_2SO_4	0.863	2.465
$CaCO_3$	0.123	0.345
$MgBr_2$	0.076	0.217
Total	35.000	99.997

Many elements in addition to those included in this list are dissolved in one form or another. For instance, one gram of silver has been estimated to be present in 100,000,000 grams of sea-water, while about five times as much gold occurs. In fact, traces of almost all the rare metals have been detected. But the total quantity of all dissolved solids, except those listed above, is so small that it cannot be detected by any of the practical methods used in the measurement of salinity.

(*b*) *Direct measurement of salinity.*—The most natural method of determining the salinity of a given sample of water would seem to be that of evaporating a definite quantity of the water and weighing the residue. This method, however, has proved to be too inaccurate for oceanographic purposes. In order to expel the last trace of water vapor the residue must be heated to redness and, in doing this, hydrochloric acid and carbon dioxide escape in amounts which cannot, as was formerly believed, be accurately determined.

To overcome this difficulty a method was devised by Knudsen and Sörenson for obtaining a residue which could be accurately measured. Helland-Hansen (1911–12, p. 33) describes this method as follows:

> To a weighed quantity of sea-water was added hydrochloric acid and chlorine-water; the whole was then vaporized, and the salts were dried and weighed; the salt residue had first to be heated for some time at 480° C. to render the weight invariable; by a special examination a correction was found for the difference between the amount of chlorine in the vaporized salt and that of the original water-sample.

While this method gives exceedingly accurate results it does not, strictly speaking, give the salinity as heretofore defined. However, it differs but slightly, being only 0.10 to 0.15 $^{o}/_{oo}$ less, and their ratios are so nearly constant that, for all practical oceanographic purposes, the value obtained by this method may be used instead of the salinity proper. This is now done and the term salinity has taken on the following technical meaning (see Helland-Hansen, 1911–12, p. 33): "The

salinity (*per mille*) of sea-water is equal to the weight, in grams, of all the salts dissolved in one kilogram of water, when the carbonates are converted into oxides, when the bromine and the iodine are replaced by chlorine, and the organic substances oxidated."

While this method is used for obtaining the standard values of salinity, it is not adapted to researches requiring a series of rapid analyses and demanding a minimum of expense. To meet such requirements the methods used in practice are all indirect.

(*c*) *Methods of measurement in general use.*—These methods depend upon the definite relation of salinity to specific gravity, upon the empirical assumption of a constant proportion of each salt to all the others, or, very infrequently, upon the effect of the dissolved salts on certain physical properties of water, such as its index of refraction and electrical conductivity. For convenience, tables have been prepared showing the magnitudes of physical and chemical properties corresponding to salinities ranging from zero to the highest value (about 40 $^{0}/_{00}$) required in oceanographic investigations. It is customary to measure either the specific gravity or the chlorine content directly and obtain the correlative value ($S\,^{0}/_{00}$, $S\,\frac{0}{4}$, or $Cl\,^{0}/_{00}$) from such reduction tables. The tables almost universally employed since 1901 were compiled by Knudsen (1901) and are based upon the values of salinity obtained by the method of Knudsen and Sörensen as above described.

2. METHODS OF SALINITY DETERMINATION EMPLOYED BY THE SCRIPPS INSTITUTION

The determination of the salinities of all water samples so far collected by the Scripps Institution are obtained from direct measurements of the specific gravity or the chlorine content, and all reductions are made by Knudsen's (1901) tables. In measuring the specific gravity, the pycnometer, hydrometer, and sinker are used, while the chlorine content is measured by Mohr's titrimetric method.

(*a*) *The pycnometer method.*—The pycnometer used is of the Gay-Lussac pattern, provided with a ground-glass stopper having a fine perforation through which an excess of water is forced when the bottle is closed. Two sizes are used, one having a capacity of 50 c.c., and the other of 100 c.c. Most of the determinations are made with the larger size.

In using this instrument the temperature of the enclosed sample is taken by means of a standard thermometer whose bulb is so immersed as to give the temperature at the center of the pycnometer. The thermometer is graduated into divisions of one-tenth of a degree C. and the temperature read to the nearest 0°02. When the reading becomes constant the thermometer is removed and enough more of the sample, usually 2 c.c., is added to fill the bottle. The stopper is then carefully inserted and the excess of water forced through its top is immediately wiped off with the thumb. When the outside of the pycnometer is thoroughly dried, its apparent weight is measured to the nearest milligram and the specific gravity found from this weight, corrections for buoyancy being made.

Each pycnometer is carefully calibrated from observations made on distilled water. The calibration formula relative to one of the 100 c.c. instruments was, in this way, found to be

$$V_t = 100.393 + 0.00282\ (t° - 20°)$$

where V_t is the volume of the instrument in cubic centimeters at the temperature t. The accuracy of this formula is shown below, where the volumes computed by its use are compared to those obtained by direct measurement at the particular temperatures in question:

Temperature t	V_t computed (1)	V_t observed (2)	Differences (1-2)
12°65 C.	100.3715	100.3724	—0.0009
17.05	100.3847	100.3842	0.0005
17.48	100.3859	100.3863	—0.0004
18.75	100.3895	100.3900	—0.0005
19.60	100.3929	100.3927	0.0002
23.66	100.4033	100.4030	0.0003
23.86	100.4039	100.4039	0.0000
24.46	100.4055	100.4062	—0.0007
30.00	100.4212	100.4208	0.0004

These results show that the volume computed from the formula differs from each measured value by less than 0.001 c.c., while the average is about half as much. The above calibration formula, therefore, gives the volume of the pycnometer within a relative error of 1 in 200,000.

From this formula, together with the weight of the pycnometer itself, the specific gravity, $S\ \frac{\theta}{4}$, is computed as follows:

$$S\ \frac{\theta}{4} = 1.023667 - 0.0000288\ (\theta° - 20°) + \frac{(w - 131.90)}{100.293}$$

where θ is the temperature of the water sample at the time of measurement, and w the apparent weight, in grams, of the pycnometer filled with the water sample. If the temperature, θ, lies between 10° and 30° C and is read to within 0°.03, and if the weight w is determined to within one milligram, it is possible to obtain the specific gravity, $S\frac{\theta}{4}$ to an accuracy of 1 in 100,000.

While this accuracy is possible, it is rarely obtained in practice. Small air bubbles may at times escape notice, the temperature actually read may not represent, with sufficient accuracy, that of the sample at the time the pycnometer is closed, or several other sources of slight error may be unconsciously met with when a large number of samples are being tested which are avoided during calibration tests.

In order to reduce such errors to a minimum, two pycnometers, independently calibrated, were alternately used until about two hundred samples had been tested, when the calibration constants were checked by observations on distilled water. As an additional check the same samples were occasionally tested by both instruments. Proceeding in this way, an average accuracy of 2 in 100,000 was obtained, although in some instances the error was greater. The most serious objection to this method is the time required which, including the necessary computations, amounts to about ten minutes, in spite of the fact that tables were compiled to facilitate the computations.

(*b*) *The hydrometer method.*—In the fall of 1908 three sets of hydrometers made by R. Küchler, of Ilmenau in Thüringen, were procured. The five instruments in each set range respectively from 1.000 to 1.007, 1.006 to 1.013, 1.012 to 1.019, 1.018 to 1.025, and 1.024 to 1.031. Their volumes range from 110 to 130 c.c. and the volume of their stems corresponding to one scale-division is 0.0001 of that of the hydrometer. The stems are about four millimeters in diameter, the length of one scale-division being about one millimeter.

When using these instruments, the place on the stem cut by the level water surface is read and care taken to have the instrument and especially its stem clean. The hydrometer is allowed to oscillate and is read just after coming to rest, the stem thus being wet for a slight distance above the water surface. The temperatures are estimated to 0°.05 C by a floating thermometer graduated to 0°.2.

The readings of the hydrometer are, of course, corrected for the variation in temperature at the time of observation and two separate determinations are made of each sample, the results obtained being

averaged. Assuming other sources of error to be constant (see p. 38), the specific gravity, $S\frac{\theta}{4}$, is obtained from the following formula:

$$S\frac{\theta}{4} = R - [k + a\ (\theta° - 17°5)]$$

where R is the hydrometer reading, θ the temperature at the time of observation, and k and a calibration constants depending upon the particular instrument used. These constants were determined from a series of readings made with each hydrometer on water samples whose specific gravities had previously been measured with a pycnometer.

An estimate of the accuracy of this hydrometer method was made by comparing a series of specific gravities determined with a pycnometer with those computed from hydrometer readings of the same samples. The following list, for example, shows such a comparison with respect to the values obtained with two hydrometers (nos. 1 and 2) each having a range from 1.024 to 1.031, the calibration formulae being

$$\text{no. 1, } S\frac{\theta}{4} = R - [0.00167 + 0.000029\ (\theta° - 17°5)]$$

$$\text{no. 2, } S\frac{\theta}{4} = R - [0.00175 + 0.000029\ (\theta° - 17°5)]$$

List of Comparative Determinations

	Pycnometer	No. 1 hydrometer		No. 2 hydrometer	
θ	$S\frac{\theta}{4}$	$S\frac{\theta}{4}$	difference	$S\frac{\theta}{4}$	difference
21°74 C.	1.02322	1.02330	—0.00008	1.02325	—0.00003
21.28	1.02336	1.02346	—0.00010	1.02342	—0.00006
21.07	1.02359	1.02364	—0.00005	1.02361	—0.00002
21.03	1.02371	1.02367	0.00004	1.02371	0.00000
21.01	1.02355	1.02349	0.00006	1.02353	0.00002
20.85	1.02343	1.02348	—0.00005	1.02344	—0.00001
20.74	1.02407	1.02406	0.00001	1.02407	0.00000
20.46	1.02413	1.02415	—0.00002	1.02411	0.00002
20.35	1.02368	1.02364	0.00004	1.02375	—0.00007
20.32	1.02403	1.02388	0.00015	1.02395	0.00008
19.90	1.02372	1.02365	0.00007	1.02371	0.00001
19.73	1.02389	1.02389	0.00000	1.02391	—0.00002
19.71	1.02392	1.02387	0.00005	1.02388	0.00004
19.68	1.02380	1.02389	—0.00009	1.02379	0.00001
19.50	1.02391	1.02390	0.00001	1.02390	0.00001

While the mean error, as shown by this list, is only about 0.00005, that actually met with in practice was fully twice as large, and occasional errors as large as 0.00025 were found.

We had hoped, by employing these hydrometers and occasionally checking the results with a pycnometer, to reduce materially the time and still maintain the requisite degree of accuracy. While it has been possible to make twelve observations per hour, the saving in time is more than offset by the loss in accuracy, so that the method was discontinued.

(*c*) *Mohr's titrimetric method.*—This method was first used in the summer of 1910. It is a volumetric method by which the chlorine or, more correctly, the halogen content in a definite volume of sea-water is precipitated by a measured volume of a solution of silver nitrate ($AgNO_3$) of known strength. The strength of this solution may be determined in several ways, but the one commonly used and upon which we relied entirely is that of titrating a sample of "normal sea-water" of known chlorine (halogen) content. This normal water, as well as the apparatus used, was obtained from the Central Laboratory of the International Commission at Christiania. In titrating, yellow potassic chromate (K_2CrO_4) is used as an indicator which, reacting on the silver nitrate after all the halogens are precipitated, produces the red precipitate of silver chromate (Ag_2CrO_4). For further details concerning the method and apparatus used see Helland-Hansen, 1911–12, pp. 34–39.

After several weeks' practice, a series of water samples taken from the ocean and from San Diego Bay were carefully tested by this method and compared with measurements of the same samples made with the pycnometer. The results, reduced to specific gravity $S\frac{0}{4}$ by means of Knudsen's tables, are listed on the opposite page.

While the mean error, as shown by this list, is about 0.00007, it has been occasionally found as large as 0.00020. Furthermore, the magnitude of the error is so erratic that the method has, thus far, proven unreliable. In addition, the time required has been fully as great as with the pycnometer, and the expense involved is much greater. The method was, therefore, discontinued.

(*d*) *The sinker method.*—Repeated attempts were made to find a method of determining salinity which would combine the accuracy of the pycnometer with the speed of the hydrometer. These efforts culminated in 1912 when a method depending on the apparent weight

(1) pycnometer $S\frac{0}{4}$	(2) titration $S\frac{0}{4}$	difference (1)-(2)
1.02687	1.02691	—0.00004
1.02688	1.02685	0.00003
1.02696	1.02689	0.00007
1.02697	1.02689	0.00008
1.02697	1.02692	0.00005
1.02697	1.02714	—0.00017
1.02697	1.02710	—0.00013
1.02698	1.02691	0.00007
1.02699	1.02682	0.00017
1.02701	1.02694	0.00007
1.02702	1.02699	0.00003
1.02703	1.02690	0.00013
1.02704	1.02709	—0.00005
1.02704	1.02705	—0.00001
1.02706	1.02709	—0.00003
1.02708	1.02700	0.00008
1.02709	1.02713	—0.00004
1.02710	1.02707	0.00003
1.02710	1.02725	—0.00015
1.02712	1.02712	0.00000
1.02712	1.02698	0.00014
1.02713	1.02713	0.00000
1.02715	1.02702	0.00013
1.02716	1.02718	—0.00002
1.02716	1.02722	—0.00006
1.02719	1.02712	0.00007
1.02720	1.02718	0.00002
1.02720	1.02729	—0.00009
1.02724	1.02719	0.00005
1.02728	0.02721	0.00007
1.02739	1.02733	0.00006
1.02744	1.02735	0.00009
1.02746	1.02746	0.00000
1.02748	1.02753	—0.00005
1.02750	1.02742	0.00008
1.02751	1.02751	0.00000
1.02751	1.02746	0.00005
1.02752	1.02753	—0.00001
1.02752	1.02748	0.00004
1.02760	1.02761	—0.00001
1.02763	1.02754	0.00009
1.02765	1.02772	—0.00007
1.02771	1.02767	0.00004
1.02778	1.02777	0.00001
1.02794	1.02791	0.00003
1.02868	1.02852	0.00016

of a sinker suspended in water was developed by one of us, G. F. McEwen. Although the apparatus was not fully ready for use until after all the samples herein tabulated were tested, a discussion of the method is given for comparison with those just described.

A small cylindrical glass sinker (*s*), having a volume of about 25 c.c. and being suitably weighted and hermetically sealed, is suspended by a fine silver wire (0.09 mm. in diameter) from one arm of a Sartorius chemical balance (sensitive to 0.1 mmg.) in a cylindrical funnel (*c*) which is used for holding the water. A similar glass funnel (*f*) is supported above the balance case and a tube (*t*), provided with a valve (*v*), leads from the neck of this funnel through the side of the balance case and serves to carry the water into the cylindrical funnel (*c*). In order to prevent the formation of air-bubbles the extremity of the tube is tapered to an inside diameter of one millimeter and is so arranged as to direct the stream against the wall of the funnel (*c*). From the neck of this funnel a drainage tube (*d*) passes through the side of the balance case.

The manner of operation is as follows: The funnel (*f*) is filled to a certain height with the water sample and after allowing it to stand until all the air-bubbles have been expelled the valve (*v*) is opened, allowing the water to flow into the funnel (*c*) until the top of the sinker is covered by about three-fourths of an inch of water. The valve (*v*) is then closed and the next sample placed in the funnel (*f*). A thermometer graduated to tenths of a degree, which is always kept suspended between the sinker and the wall of the funnel (*c*), is then read and the beam of the balance released for weighing. As soon as the oscillation ceases the balance scale is read, after which the beam is raised. As a check, the thermometer is again read and the weighing repeated. If the two results agree the water is immediately drained through the tube (*d*) into the bottle from which it was taken. After the tubing has been thoroughly flushed with some of the water of the next sample, everything is in readiness for the next test.

In calibrating the sinker the theoretical formula was reduced to the following simpler form, which is accurate to five parts in a million providing the specific gravity, $S\frac{\theta}{4}$, lies between 0.99 and 1.025 and the temperature at the time of weighing lies between 10° and 30° C:

$$S\frac{\theta}{4} = c + a(20° - \theta°) + k(w - w')$$

where c is a constant depending upon the value of w', a and k calibration constants, depending upon the sinker used, θ the temperature

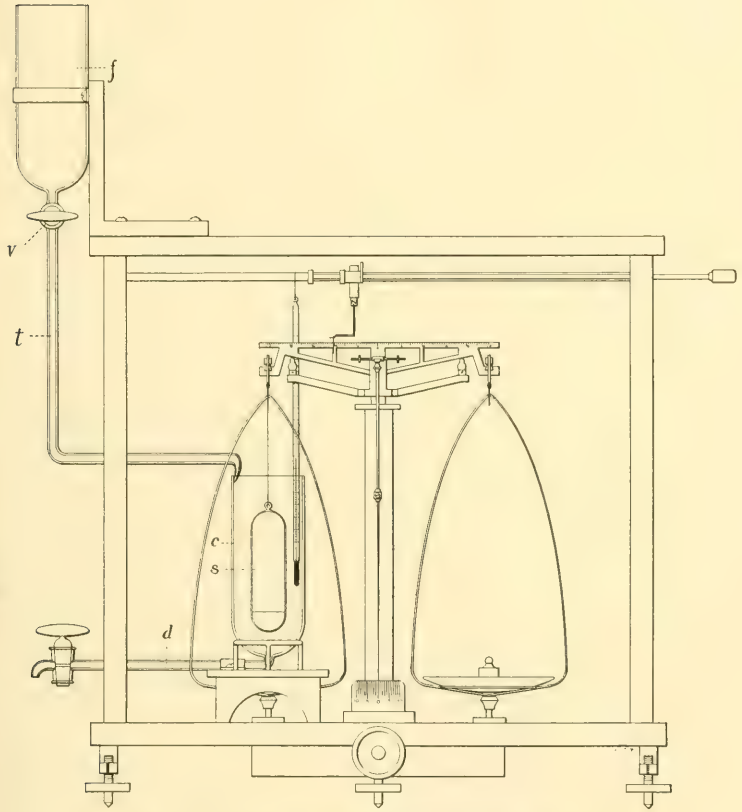

Fig. 3. "Sinker" apparatus for measuring specific gravity.

at the time of weighing, w the apparent weight (in mmg.) of the immersed sinker, and w' a constant weight (in mmg.) selected so as to facilitate computation. This formula for a particular sinker is

$$S\,\frac{\theta}{4} = 1.024905 + 0.000033(20° - \theta°) - 0.00003984(w - 8860)$$

Its accuracy is indicated below where the specific gravity, $S\,\frac{\theta}{4}$, of distilled water as given in the standard physical tables is compared to that computed by the formula:

(W-8860)	$\theta°$	$S\,\frac{\theta}{4}$ standard (1)	$S\,\frac{\theta}{4}$ computed (2)	difference (1-2)
713.2	28.13	0.996220	0.996215	0.000005
708.7	27.35	0.996445	0.996420	0.000025
707.2	27.18	0.996490	0.996485	0.000005
702.9	26.39	0.996700	0.996685	0.000015
700.6	26.05	0.996795	0.996810	—0.000015
699.4	25.87	0.996850	0.996840	0.000010
696.1	25.29	0.996990	0.996995	—0.000005
690.9	24.41	0.997220	0.997225	—0.000005
679.7	22.22	0.997750	0.997745	0.000005
659.9	17.83	0.998655	0.998675	—0.000020

In order to obtain an additional check on the accuracy of this method, the specific gravity of a series of samples determined in this way was compared with that determined with a pycnometer. The results are listed below:

$S\,\frac{0}{4}$ sinker (1)	$S\,\frac{0}{4}$ pycnometer (2)	differences (1-2)
1.02770	1.02771	—0.00001
1.02770	1.02767	0.00003
1.02767	1.02766	0.00001
1.02767	1.02766	0.00001
1.02764	1.02766	—0.00002
1.02760	1.02757	0.00003
1.02760	1.02756	0.00004
1.02757	1.02761	—0.00004
1.02754	1.02756	—0.00002
1.02752	1.02752	0.00000
1.02740	1.02738	0.00002
1.02739	1.02738	0.00001
1.02709	1.02707	0.00002
1.02693	1.02694	—0.00001
1.02693	1.02691	0.00002
1.02692	1.02695	—0.00003
1.02691	1.02691	0.00000
1.02688	1.02687	0.00001

This table shows that the average difference between the mean of the two determinations made by the sinker and that made by the pycnometer method is within 0.00002, while the extreme difference does not exceed 0.00004. Since these differences involve the errors inherent in both methods and since the average error due to the pycnometer (see p. 30) is approximately 0.00002, it is obvious that that due to the sinker can exceed 0.00001 but slightly, which checks the estimate heretofore given (see p. 36). Of course blunders are occasionally made which result in an error exceeding 0.00004, but the second test which is always made brings it to light immediately, whereupon a third test determines which of the two is correct. Since, in addition to its great inherent accuracy, the observations and reductions involved in two independent determinations of $S\frac{0}{4}$ require only five minutes, the method is by far the most satisfactory of any thus far tried.

3. COMPARISON OF OUR EXPERIENCE RELATIVE TO ACCURACY AND EFFICIENCY IN WATER ANALYSIS WITH THE EXPERIENCE OF OTHER INVESTIGATORS

(*a*) *Brief review of our own experience.*—The experience with the methods used by the Scripps Institution has shown that measurements of specific gravity made with the pycnometer are more satisfactory than titrations of chlorine content. Although, after some practice, we obtained fairly consistent results with the titration method, we failed to reduce the time of a single test below that required by the pycnometer method. The latter also gave much more accurate results, the error in specific gravity seldom exceeding 0.00003 and averaging less than 0.00002; the error in the titration method averaged 0.00007, frequently being as great as 0.0001, and occasionally as much as 0.0002.

The hydrometer and sinker methods proved to be the most rapid, the former requiring five minutes for a single determination, including the necessary reductions to $S\frac{0}{4}$, while two independent determinations and reductions can be made by the sinker method in the same time. However, while this method has proved to be as accurate as the pyc-

nometer method, measurements made with the hydrometers are exceedingly erratic, errors in specific gravity of two or three in ten thousand being not uncommon while the average was as great as one in ten thousand.

Altogether, therefore, the sinker method is the most satisfactory. In addition to being as accurate as the pycnometer and as rapid as the hydrometer method, it has the advantage of enabling two independent determinations to be made without undue loss of time, which greatly reduces the chance of blunders.

(*b*) *The experience of others.*—Nansen (1902), after careful and detailed investigations made during the Norwegian North Polar Expedition of 1893–1896, concluded that the specific gravity of seawater determined by any ordinary hydrometer of constant or variable weight may be considerably in error. The magnitude of the error he found to be proportional to the diameter of the stem as compared with the volume of the body of the instrument. The source of error he discovered to be due to surface tension of the water, which varies in an erratic manner depending upon contamination and the time during which the surface is exposed. The readings of a Küchler hydrometer, such as used by the Scripps Institution, he found to vary by 0.0003 in consequence of a variation in surface tension from its maximum to its minimum. Even with the greatest possible care in cleaning the hydrometer and testing jar, if the *water surface* be neglected, an occasional variation in surface tension would occur sufficient to alter the reading by 0.0002. By taking precautions to clean the *water surface* thoroughly, Nansen was able to obtain the specific gravity to an accuracy of two in a hundred thousand, but he found the method so troublesome that he recommends the use of a pycnometer, sinker, or hydrometer of total immersion.

This experience of Nansen's is corroborated by that of Schott (1902) and Buchanan (see Nielsen, 1912), the former having neglected the error arising from surface tension while the latter avoided it by using distilled water as a means of control and calculating the error involved in each determination. Schott estimated the error to be fifteen in a hundred thousand, while Buchanan found an error in his determinations of only three in a hundred thousand.

With respect to Mohr's titrimetric method Dickson (1901, p. 74), relative to his own experience, says: "The results seem to show conclusively that without spending the time necessary for the highest degree of accuracy, but merely taking ordinary care, the chlorine of

large numbers of samples can be determined with comparatively little trouble to within the admissible limit of error, $\pm 0.03\ ‰$." Since this corresponds to an error in specific gravity of five in a hundred thousand, his results are more accurate than ours.

Regarding the accuracy and rapidity with which this method may be carried out, Helland-Hansen (1911–12, p. 39) states that in some Norwegian investigations, "one series of 260 water samples was titrated twice, with a mean difference between two determinations of the same sample equal to $0.016\ ‰$ in salinity," which corresponds to about 15 in 1,000,000 in specific gravity. Relative to the speed he says: "With some practice the whole process of titration can be gone through in about four and one-half minutes."

To ascertain the accuracy of the same method Nansen (1902) had a number of water samples independently titrated by several investigators. By comparing the results he concluded that, under favorable conditions, when the investigator had had special practice and the determinations were controlled after every tenth or fifteenth test by the titration of "normal sea-water," the specific gravity could be determined within 15 or 25 in 1,000,000. However, he says (1902, p. 231): "Considering that even the results obtained by the methods of gravimetric analysis of the chlorine (halogens) may differ as much as $0.037\ ‰$ [which corresponds to 3 in 100,000 in specific gravity] with such skillful investigators as Pettersson and his assistants, I think the probability is that the accuracy attained by titration will in many cases be lowered." This is corroborated by Bjerrum (1904) who, after making a thorough study of all the sources of error inherent in the method, concluded that their combined effect could not be reduced below a mean error in a single specific gravity determination of 22 in 1,000,000, and, since this does not take into consideration errors which ought not to be committed but which are not always avoided in practice, the actual error is apt to be somewhat greater.

Finally, there are errors in titration peculiar to the observer himself. Perhaps the best illustration of this is afforded by the following measurements, where the results obtained by two observers (A and B) in the titration of the same samples are compared. While the results were originally published by Homén (1904, p. 39) in terms of chlorine content, we have reduced them to specific gravity ($S\frac{0}{4}$) by means of Knudsen's tables, in order to make them comparable to those so far discussed.

Specific gravity $S^{\frac{0}{0}}_{4}$		Difference
A	B	B–A
1.00436	1.00442	0.00006
1.00477	1.00481	0.00004
1.00500	1.00508	0.00008
1.00513	1.00518	0.00005
1.00527	1.00531	0.00004
1.00534	1.00540	0.00006
1.00534	1.00538	0.00004
1.00537	1.00543	0.00006
1.00540	1.00547	0.00007
1.00544	1.00544	0.00000
1.00544	1.00546	0.00002
1.00547	1.00551	0.00004
1.00557	1.00563	0.00006
1.00557	1.00563	0.00006
1.00560	1.00565	0.00005

Attention is called to the fact that these differences are in every case in the same direction, B's determinations always being higher than A's. It is therefore evident that the titration method is subject to a systematic error due to the "personal equation" of the observers which is nearly twice as great as that admitted to be inherent in the method. This is probably due to the difference in judgment of color for, as stated by Bjerrum (1904, p. 8): "The greatest annoyance in the titration with chromate of potash as the indicator, especially to unexercised people, is that even a strong tint may disappear on fast stirring for some time."

It would seem, from the above discussion, that Mohr's titrimetric method is, as a rule, capable of a high degree of accuracy. However, since in such cases the determinations have been made on samples taken from a region strictly comparable to that from which the "normal sea-water" is obtained, our own failure to attain a degree of accuracy comparable to the pycnometer method may in part be due to a deviation from a normal proportion of the salts in the water about San Diego (see p. 41). Nevertheless the titration method is gaining ground in oceanography, not because it can replace the pycnometer in accuracy, because the latter is used for standardizing all other methods, but for the reason given by Helland-Hansen (1911–12, p. 39), namely: "it is so rapid that it makes possible the consecutive treatment of a great collection of water samples, and so accurate that none of the other tolerably fast methods bear comparison with it."

4. RELIABILITY OF THE ASSUMPTION OF CONSTANT PROPORTION OF THE SALTS IN SEA-WATER

Reference has been frequently made, in the preceding pages, to Knudsen's tables by means of which direct measurements of the chlorine (halogen) content, specific gravity, or salinity of samples of sea-water may be expressed in terms of each of the others. Except as regards the relation between specific gravity and salinity, each of which is a definite function of the other, the use of these tables depends upon the reliability of the assumption that the halogen salts bear a definite relation to the total salts dissolved in sea-water, as illustrated by the formula:

$$S\,{}^{0}/_{00} = 1.8050\ Cl\,{}^{0}/_{00} + 0.030$$

Concerning this reliability Helland-Hansen (1911–12, p. 31) says: "Although different analysers have found slightly different values for the relative percentage of the salts in sea-water, it is nevertheless proved that there is a constant proportion between the amount of chlorine and the salinity or specific gravity, so that tables of the respective values can be made out." Again (p. 32) he says: "The specific gravity of the sea-water wholly depends upon the quantity of dissolved salts. Now, as the salinity has everywhere a uniform composition, it is clear that the relations between the specific gravity and the salinity or the amount of chlorine may be expressed in a general formula with fixed constants." In spite of these positive statements, however, he (p. 31) says: "In the waters of the Red Sea, for instance, the relative amount of chlorine is a little below the normal; further, there is generally a slight increase of the relative amount of carbonates with increasing depth; also, the formation of ice involves a retention of proportionally more sulphates than chlorides in the ice, so that the secreted brine contains a small excess of chlorides, and the water around melting ice a corresponding excess of sulphates."

While Helland-Hansen (1911–12, p. 32) reaches the conclusion that "these anomalies are insignificant . . . [and] . . . can only be detected by extremely delicate analyses, and may be overlooked in practical work," this is scarcely in harmony with the conclusion reached by Nansen (1906). He made an extensive series of analyses of water from the North Atlantic Ocean and the Barents Sea, having each water sample independently tested by two observers, one of whom

measured the specific gravity with a hydrometer of total immersion (corresponding in accuracy with the pycnometer) while the other measured the chlorine by Mohr's titrimetric method. From an examination of the results Nansen (1906, p. 11) concluded that, while the chlorine content of the North Atlantic east of Greenland was but slightly less than normal, that from the Barents Sea exceeded the normal by an amount which, allowing for the errors in measurement, makes the specific gravity computed from it 0.000025 too high.

Our own observations bear out, in a general way, this conclusion of Nansen. A series of samples taken from San Diego Bay as well as the ocean were carefully titrated and also tested for specific gravity with a pycnometer. A comparison of the results (see p. 33) shows that, while the average difference in the values obtained by the two methods is only 0.000025, differences of as much as 0.00015 frequently occur. Furthermore, repeated titrations of the "normal sea-water" rarely gave results differing, in specific gravity, from the true value by more than 0.00004, thus indicating that the larger differences may have been partly due to a variation in the proportion of the salts in the water of this region. However, many more similar observations must be made before such variation can be proven.

Nevertheless it is certain that, while the relation between chlorine content and salinity may be so nearly the same in many regions that the difference can not be detected by the usual methods, there are regions where the difference is very apparent. Therefore, until the magnitude of this difference is accurately known for a given region, it would undoubtedly be wiser to determine both the chlorine content and specific gravity directly than to depend upon a reduction formula which may not apply with sufficient accuracy. If this were done and the observations repeated whenever the values obtained by both methods differed in specific gravity by more than 0.00003, one could readily decide whether or not the difference was due to an accidental error in measurement or to a variation in the composition of the sea-water. Such a comparative series would certainly be of increasing value as the work progressed.

Since it has not been feasible for the Scripps Institution to make such an extensive series of comparisons, the direct method of measuring specific gravity was finally adopted, because:

1. In plankton investigations a knowledge of variations in salinity is of fundamental importance, and it is more advisable to measure it by the most direct method available than to measure the chlorine con-

tent and depend upon the assumption that the water of this region is always identical in composition to the "normal sea-water."

2. In hydrodynamic investigations, especially relative to convective circulation, a knowledge of the densities *in situ* is essential and, of course, depends directly upon specific gravity.

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PART 2

TABULATION OF DATA

A. General Explanation of Tables

(*a*) *Arrangement.*—While all our data form an organic whole they have, for convenience in use as well as in tabulation, been arranged into several tables. The hydrographic data are tabulated first because they have an intrinsic value in addition to their essential relation to the plankton and dredge collections. Accordingly all the data relative to ocean temperatures and salinities are given in Table 1, those relative to San Diego Bay in Table 2, and the supplementary data concerning gas content and soundings in Tables 3 and 4. Again, while all the biological collections were accessioned in chronological order irrespective of the nature of the haul, plankton collecting has been carried on much more extensively than dredging, so that the data relative to plankton hauls are given in Table 5, and the dredge hauls in Table 6. All tables are arranged on the same general plan.

(*b*) *Recording of position.*—All positions are entered in latitude and longitude, the latter being measured from Greenwich. Whenever the error (see p. 18) was estimated as less than half a mile the position, except as stated below, is entered to tenths of one minute. In those instances where the error lay between one half and one mile, it is entered to the nearest even minute, and in those rarer instances where the error was still larger the latitude and longitude are not entered at all, the approximate position being given by the *section* (see p. 46).

Unless otherwise noted in the tables, the boat was allowed to drift during the actual collecting. In case the position at the end of the drift was determined, the latitudes and longitudes relative to the collections are not entered as such, but the initial and final positions together with this statement are given: "From ——— to ——— the boat drifted from the above position to the following position," the blanks being filled in with the times corresponding to the two positions. In some rare instances, however, it has been impossible to determine the amount and direction of drift; in such cases the initial latitudes

and longitudes are repeatedly tabulated without regard to the possible error involved.

(c) *Meaning and use of sections.*—In making certain biological and hydrographic investigations it is necessary to compare small areas of approximately the same size which differ from each other in their distance from the coast, average depth of water, nature of bottom, and so on. As an aid to such investigations the region explored, or likely to be explored, by us has been divided into rectangular areas, or sections, each containing approximately twenty-five square miles. To be more precise, the sections were, for convenience, so chosen that the length of their north and south boundaries would be five minutes in longitude, while that of their east and west boundaries would be five minutes in latitude. In defining them two base lines were chosen and each section was designated by a *number* giving its position west of one base line, and either a *subscript* giving its position north, or an *exponent* giving its position south of the other base line.

To avoid complications arising from sections lying eastward as well as westward from the north and south base line, the meridian of 114° W was chosen and, since the region thus far explored lies, in the main, between the parallels of 32° and 34° N, the former was chosen as the second base line, thereby reducing the use of exponents and large subscripts to a minimum. Thus, as illustrated in figure 4, 24_{11} defines the twenty-fourth section west of 114° W and the eleventh section *north* of 32° N, while 24^{11} defines one whose distance west of 114° W is the same but which is the eleventh one *south* of 32° N.

It is evident that, since each section measures five minutes on a side and includes all positions within 2.5 of its centre, the latitude and longitude of any observation bears a definite and simple relation to the number and subscript (or exponent) of the section as indicated by the following formulae:

$$N = 12(\text{long.} - 114^\circ)$$
$$S = 12(\text{lat.} - 32^\circ)$$
$$E = 12(32^\circ - \text{lat.}^\circ)$$

where N is the section *number,* S the section *subscript,* E the section *exponent,* and where the latitude and longitude are expressed in degrees to the nearest 5′, or twelfth of a degree. Thus the section corresponding to 33° 12.1 N and 118° 6.3 W is such that its center will lie at the intersection of 33° 10′ N and 118° 5′ W, whence

$$N = 12(118\tfrac{1}{12}° - 114°) = 12(\tfrac{49}{12}°) = 49,$$
$$S = 12(\ 33\tfrac{2}{12}° - \ 32°) = 12(\tfrac{14}{12}°) = 14$$

the section therefore being designated by 49_{14}.

In all our tables the section in which each observation was made is entered, providing it was not made in San Diego Bay, in which event

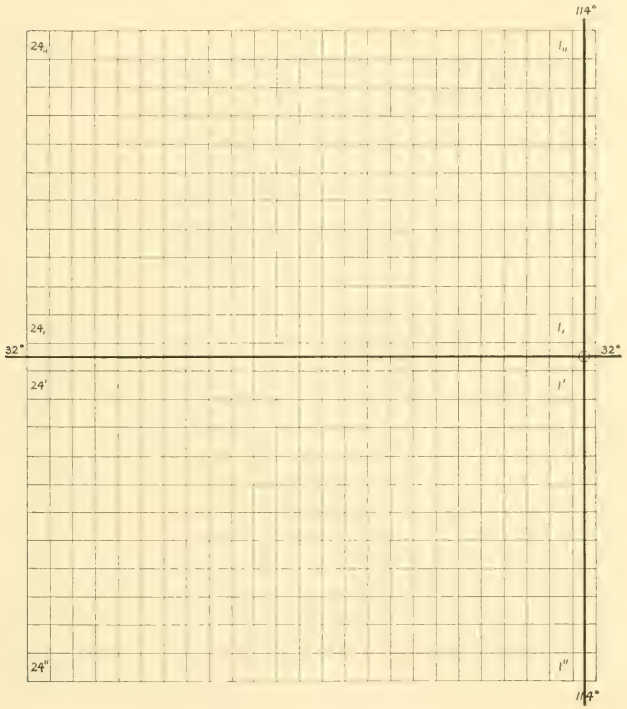

Fig. 4. Scheme for designating sections.

it is omitted and a B inserted instead. In some instances, however, observations were made so near the line of demarkation between two sections that it is uncertain which of the two was really involved. In such cases both sections are refered to, 15.5_{11}, for example, implying that the observation was made near the boundary of 15_{11} and 16_{11}, while $15_{11.5}$ implies that it was made near the boundary of 15_{11} and

15_{12}. Any section cut by the coast line is designated in one of three ways: when its center is within 2.5 west of the coast, the *number* is bracketed, when it is within 2.5 north or south the *subscript* or *exponent*, as the case may be, is bracketed, and when it is within 2.5 both west and north or south the entire symbol is bracketed. Thus $(15)_{11}$ implies that the center of the section is within 2.5 west of the coast, $15_{(11)}$ that it is within 2.5 north or south, and (15_{11}) that it is within 2.5 both west and north or south of the coast.

B. Hydrographic Data

Explanation of Table 1

This table includes all the temperature, specific gravity, and salinity determinations made from 1901 to 1912 relative to the ocean. San Diego Bay data are excluded unless made in connection with the ocean work. The few determinations of 1901 were made by Professor W. J. Raymond, and all the others by G. F. McEwen assisted by H. C. Burbridge. Soundings are not entered in this table but a list of water samples whose distances from the bottom are known to be within fifteen per cent of the depth is given in Appendix III.

First column.—Water-sample numbers entered in chronological order irrespective of the nature of the sample.

Second column.—Time when the sample was obtained entered to the nearest minute.

Third column.—Section; for explanation see page 46. The letter B indicates that the sample was made in San Diego Bay.

Fourth and fifth columns.—Latitude and longitude; for error see pages 18 and 45.

Sixth column.—Depth of sample, entered to the nearest meter above 200 and to the nearest five below that depth; for error see page 20.

Seventh column.—Temperature *in situ;* for accuracy see pages 14 and 17.

Eighth, ninth and tenth columns.—Specific gravity of the sample under atmospheric pressure, the 1.0 being omitted; $S\frac{0^\circ}{4^\circ 0}$ that of the sample at 0° C referred to distilled water at 4° C; $S\frac{17^\circ 5}{17^\circ 5}$ that of the sample at 17°.5 C referred to distilled water at 17°.5 C; $S\frac{t^\circ}{4^\circ 0}$ density *in situ* referred to distilled water at 4° C.

Eleventh column.—Salinity *per mille* of the sample. It was determined with a pycnometer (see p. 28) unless followed by the letter *h*, which indicates a hydrometer determination (see p. 30), or the letter *c*, which signifies that Mohr's titrimetric method was used (see p. 32). The letter *k* indicates that the sample was collected with the Kofoid water bottle (see p. 11), the temperature being measured and corrected as described on page 14; all other subsurface samples were collected with Ekman reversing water bottles (see p. 12) and the temperatures measured with Richter reversing thermometers (see p. 15). A question mark indicates that a small error in depth, temperature, or salinity is suspected (see pp. 20 and 26).

TABLE 1.—OCEAN DATA

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° S 4°0	Specific gravity: 17°5 S 17°5	Specific gravity: t° S 4°0	Salinity S ‰
				June 4, 1901						
1	2:40 p.m.	(53_{21})	33° 45.7	118° 26.4	0	17°0	.....	.....	.....	.....
				June 5, 1901						
2	10:00 a.m.	(53_{22})	33 48.9	118 26.5	0	16.7	.....	.....	.....	.....
3	10:00 a.m.	(53_{23})	33 48.9	118 26.5	265	.....	2734	2599	.....	34.02
				June 6, 1901						
4	7:00 a.m.	(53_{22})	33 48.3	118 26.8	0	15.6	.....	.....	.....	.....
5	7:00 a.m.	(53_{23})	33 48.3	118 26.8	265	.....	2727	2592	.....	33.94
				June 8, 1901						
6	8:30 a.m.	52_{20}	33 40.0	118 18.7	0	16.7	.....	.....	.....	.....
7	8:30 a.m.	52_{20}	33 40.0	118 18.7	265	.....	2712	2578	.....	33.75
				June 10, 1901						
8	8:40 a.m.	(49_{21})	33 43.8	118 7.4	0	18.0	.....	.....	.....	.....
9	9:25 a.m.	$50_{(21)}$	33 44.0	118 8.0	0	18.9	.....	.....	.....	.....
10	11:50 a.m.	50_{20}	33 42.0	118 12.0	0	18.9	.....	.....	.....	.....
				June 11, 1901						
11	1:00 p.m.	(51_{21})	33 42.8	118 13.6	0	18.3	.....	.....	.....	.....
				June 12, 1901						
12	9:30 a.m.	51_{20}	33 38.5	118 14.5	0	16.0	.....	.....	.....	.....
13	11:15 a.m.	50_{20}	33 42.0	118 12.0	0	16.2	.....	.....	.....	.....
				June 13, 1901						
14	9:40 a.m.	52_{20}	33 41.0	118 18.8	0	17.6	.....	.....	.....	.....
15	12:10 p.m.	52_{20}	33 41.5	118 17.9	0	17.4	.....	.....	.....	.....
				June 14, 1901						
16	8:45 a.m.	(47_{19})	33 34.4	117 56.2	0	17.4	.....	.....	.....	.....
				July 12, 1901						
17	9:00 a.m.	51_8	32 41.4	118 14.2	0	18.2	.....	.....	.....	.....
				July 16, 1901						
18	8:30 a.m.	(38_8)	32 38.8	117 11.5	0	15.2	.....	.....	.....	.....
				July 17, 1901						
19	8:50 a.m.	39_7	32 36.9	117 14.7	0	16.4	.....	.....	.....	.....
				July 18, 1901						
20	2:30 p.m.	39_7	32 36.4	117 13.3	0	22.0	.....	.....	.....	.....
				July 19, 1901						
21	8:25 a.m.	40_5	32 26.6	117 17.6	0	20.2	.....	.....	.....	.....
22	1:20 p.m.	39_5	32 22.8	117 15.2	0	21.3	.....	.....	.....	.....
				July 20, 1901						
23	9:30 a.m.	39_7	32 37.0	117 15.0	0	18.8	.....	.....	.....	.....
				July 24, 1901						
24	9:45 a.m.	40_7	32 36.3	117 18.0	0	20.8	.....	.....	.....	.....
				July 25, 1901						
25	10:10 a.m.	41_7	32 34.2	117 23.0	0	21.0	.....	.....	.....	.....
				July 29, 1901						
26	9:40 a.m.	40_8	32 31.7	117 22.4	0	21.0	.....	.....	.....	.....
				June 12, 1908						
27	6:02 a.m.	(39_{10})	32 51.4	117 16.5	0	18.7	2696	2563	2400	33.55
28	7:44 a.m.	42_{10}	32 52.0	117 28.2	0	18.4	2705	2572	2418	33.66
29	8:15 a.m.	$42_{10.5}$	32 52.5	117 30.8	0	18.3	2691	2558	2405	33.49
30	8:45 a.m.	43_{11}	32 53.5	117 33.0	0	16.5	2698	2565	2455	33.58
31	9:26 a.m.	43_{11}	32 53.7	117 34.5	0	16.4	2692	2559	2453	33.50
32	10:30 a.m.	43_{11}	32 53.7	117 34.5	915	.....	2764	2628	.....	34.40K
33	11:14 a.m.	43_{11}	32 53.7	117 34.5	550	.....	2765	2629	.....	34.41K
34	12:45 p.m.	43_9	32 43.7	117 34.8	0	16.5	2690	2557	2447	33.48
35	1:30 p.m.	43_8	32 42.2	117 33.4	0	16.5	2705	2572	2463	33.66
36	2:27 p.m.	42_6	32 41.7	117 32.6	0	16.5	2706	2573	2464	33.68
37	3:33 p.m.	42_8	32 41.4	117 31.6	0	17.5	2696	2563	2431	33.55
				June 13, 1908						
38	6:43 a.m.	(40_{12})	33 0.2	117 20.0	0	18.5	2707	2574	2418	33.69
39	7:16 a.m.	(40_{13})	33 3.1	117 22.2	0	18.0	.....	.....	.....	.....
40	7:40 a.m.	(40.5_{13})	33 3.4	117 22.5	0	18.0	.....	.....	.....	.....
41	9:24 a.m.	(41.5_{14})	33 9.1	117 27.5	0	18.1	.....	.....	.....	.....
				June 15, 1908						
42	7:12 a.m.	39_7	32 37.2	117 14.4	0	15.0	2722	2587	2512	33.87
43	7:50 a.m.	40_8	32 37.9	117 19.5	0	15.5	.....	.....	.....	.....
44	8:12 a.m.	40_8	32 38.4	117 22.0	0	17.0	2706	2573	2453	33.68
45	8:19 a.m.	41_8	32 38.5	117 23.0	0	17.5	2713	2580	2448	33.76
46	8:49 a.m.	41_8	32 39.0	117 26.0	0	17.5	2699	2566	2434	33.59
47	9:10 a.m.	42_8	32 39.3	117 27.8	0	17.4	2715	2581	2448	33.79
48	9:59 a.m.	42_8	32 39.6	117 30.0	0	18.3	2700	2567	2414	33.60
49	10:20 a.m.	42_8	32 39.3	117 30.1	0	18.5	.....	.....	.....	.....

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° / 4°0	Specific gravity: S 17°5 / 17°5	Specific gravity: t° / 4°0	Salinity S ‰
				June 15, 1908						
50	10:35 a.m.	42_8	32° 39.0	117° 30.1	890	.....	2782	2644	.... ..	34.62K
51	11:27 a.m.	42_9	32 38.4	117 30.0	0	18.5	.... ..	.....	.... ..	.....
52	12:15 p.m.	42_7	32 37.3	117 29.8	0	18.5	.....	.....	.....	.....
53	12:20 p.m.	42_7	32 37.0	117 29.7	455	.....	2766	2630	.....	34.42K
54	1:25 p.m.	42_5	32 38.2	117 31.3	0	18.5	.....	.....	.. ...	.....
55	1:59 p.m.	42_3	32 39.6	117 33.0	0	18.3	2704	2571	2419	33.65
56	3:10 p.m.	42_8	32 41.5	117 28.0	0	18.4	2703	2570	2415	33.64
				June 16, 1908						
57	7:50 a.m.	41_{10}	32 49.7	117 26.9	0	17.5	2698	2565	2433	33.58
58	8:05 a.m.	42_{10}	32 49.1	117 30.6	0	16.9	.....	.....	.....	.....
59	9:50 a.m.	43_{10}	32 48.5	117 34.4	0	16.5	2704	2569	2460	33.65
60	11:10 a.m.	42_9	32 46.9	117 31.8	0	18.5	2705	2570	2413	33.66
61	12:01 p.m.	42_9	32 46.9	117 31.8	640	.....	2766	2630	.....	34.42K
62	12:40 p.m.	42_9	32 46.9	117 31.8	0	17.5	2699	2566	2434	33.59
63	1:30 p.m.	42_9	32 45.4	117 29.3	0	18.5	.....	.....	.....	.....
				June 17, 1908						
64	8:40 a.m.	40_{11}	32 52.8	117 22.0	0	17.4	.....	.....	.....	.....
65	12:05 p.m.	46_{12}	33 0.3	117 50.5	0	16.5	2720	2585	2476	33.85
66	1:56 p.m.	45_{12}	32 59.4	117 43.8	0	16.5	2696	2563	2454	33.55
67	2:40 p.m.	44_{12}	33 0.0	117 42.0	915	.....	2752	2616	.....	34.25K
68	3:50 p.m.	43_{12}	32 59.1	117 34.6	0	16.5	2694	2561	2451	33.53
69	4:25 p.m.	42_{12}	32 58.0	117 28.8	0	17.0	2695	2562	2441	33.54
70	4:35 p.m.	42_{12}	32 57.8	117 28.0	0	17.4	2711	2577	2447	33.74
71	5:00 p.m.	41_{11}	32 57.1	117 24.3	0	17.5	2699	2566	2433	33.59
				June 18, 1908						
72	6:35 a.m.	$(40)_{10}$	32 51.4	117 19.7	0	17.5	.....	.....	.....	.....
73	8:15 a.m.	43_{10}	32 51.4	117 32.9	0	17.5	.....	.....	.....	.....
74	9:00 a.m.	44_{10}	32 51.7	117 40.2	0	16.5	2702	2569	2460	33.63
75	9:55 a.m.	45_{10}	32 52.0	117 45.9	0	16.5	2689	2556	2448	33.47
76	12:01 p.m.	46_{10}	32 50.8	117 51.9	0	17.0	2689	2556	2438	33.47
77	1:40 p.m.	45_{10}	32 49.8	117 46.0	0	17.1	2710	2576	2454	33.73
78	2:20 p.m.	45_{10}	32 49.8	117 46.0	1025	.....	2772	2632	.....	34.50K
79	3:15 p.m.	44_{10}	32 48.9	117 40.2	0	17.5	2687	2555	2422	33.44
				June 19, 1908						
80	8:27 a.m.	41_{12}	32 57.7	117 22.7	0	17.8	2714	2581	2441	33.78
81	10:30 a.m.	(40_{12})	32 58.8	117 20.0	0	17.5	2716	2582	2450	33.80
				June 23, 1908						
82	11:45 a.m.	39_7	32 37.2	117 14.4	0	16.7	2705	2572	2458	33.66
83	12:10 p.m.	$(39_{7.5})$	32 37.5	117 16.2	0	18.1	2715	2581	2435	33.79
84	12:35 p.m.	40_8	32 38.1	117 18.0	0	18.3	2708	2575	2423	33.70
85	1:00 p.m.	40_8	32 39.0	117 21.7	0	18.5	2694	2561	2404	33.53
86	1:30 p.m.	41_8	32 39.7	117 24.4	0	18.3	2690	2557	2406	33.48
87	1:50 p.m.	41_8	32 40.4	117 26.3	0	19.0	2704	2571	2401	33.65
88	3:07 p.m.	42_8	32 41.4	117 30.3	0	18.2	2709	2576	2426	33.71
89	4:28 p.m.	42_8	32 41.4	117 30.3	0	18.3	2706	2573	2421	33.68
90	5:25 p.m.	42_8	32 42.0	117 29.4	0	18.3	2714	2580	2429	33.78
91	6:00 p.m.	41_8	32 45.0	117 25.2	0	18.3	2710	2576	2425	33.73
92	6:30 p.m.	$(40)_{10}$	32 47.8	117 21.5	0	18.2	2708	2575	2425	33.70
				June 24, 1908						
93	6:05 a.m.	40_{11}	32 56.1	117 19.0	0	18.5	2715	2581	2425	33.79
94	6:35 a.m.	(40_{12})	32 59.7	117 21.5	0	18.0	2707	2574	2429	33.69
95	7:25 a.m.	41_{12}	33 1.5	117 22.8	0	17.7	2710	2576	2439	33.73
96	8:06 a.m.	41_{13}	33 3.5	117 26.8	0	17.5	2705	2572	2439	33.66
97	8:45 a.m.	41_{13}	33 3.7	117 27.0	460	.....	2742	2607	.....	34.12K
98	9:14 a.m.	42_{13}	33 4.7	117 29.4	0	17.6	.	.....	.....	.....
99	9:40 a.m.	42_{13}	33 4.7	117 29.4	520	.....	2745	2610	.....	34.16K
100	10:25 a.m.	42_{13}	33 5.0	117 29.8	0	18.4	2703	2570	2416	33.64
101	11:05 a.m.	42_{13}	33 5.5	117 31.6	0	18.5	.....	.....	.....	.....
102	11:30 a.m.	42_{13}	33 5.6	117 31.8	660	.....	2742	2607	.....	34.12K
103	2:10 p.m.	43_{13}	33 6.4	117 35.4	0	17.9	2704	2571	2428	33.65
104	3:50 p.m.	41.5_{12}	33 0.2	117 27.5	0	18.5	.....	.....	.....	.....
105	4:50 p.m.	40_{11}	32 54.4	117 20.0	0	18.5	2716	2582	2426	33.80
				June 25, 1908						
106	9:15 a.m.	40_{11}	32 55.0	117 21.4	0	18.6	2708	2575	2415	33.70
107	2:45 p.m.	$(40)_{10}$	32 50.7	117 21.5	0	19.5	2714	2580	2397	33.78
108	8:55 p.m.	(39_{10})	32 51.3	117 16.1	0	18.5	2717	2583	2427	33.81

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position		Depth in meters	Temperature in centigrade	Specific gravity			Salinity S ‰
			North latitude	West longitude			$S\frac{0°}{4°0}$	$S\frac{17°5}{17°5}$	$S\frac{t°}{4°0}$	
				June 26, 1908						
109	5:34 a.m.	$(40)_{10}$	32° 47.6	117° 21.8	0	18°5	2715	2581	2424	33.79
110	7:25 a.m.	42_9	32 40.5	117 31.4	0	18.0	2709	2576	2430	33.71
111	9:00 a.m.	43_8	32 40.3	117 35.0	0	18.2	2704	2571	2421	33.65
112	9:50 a.m.	43_8	32 39.6	117 34.5	0	18.3	2706	2573	2421	33.68
113	10:28 a.m.	43_8	32 39.3	117 36.0	0	19.4	2713	2579	2399	33.76
114	11:00 a.m.	43_8	32 38.7	117 37.1	0	19.1	2718	2583	2413	33.83
115	11:46 a.m.	43_8	32 38.2	117 37.2	0	19.6	2709	2576	2390	33.71
116	1:02 p.m.	42_9	32 39.5	117 30.3	0	20.0	2708	2575	2379	33.70
117	2:08 p.m.	41_8	32 41.3	117 27.0	0	19.5	2712	2578	2396	33.75
118	3:23 p.m.	$(40)_{10}$	32 48.4	117 19.4	0	19.9	2719	2585	2393	33.84
119	3:48 p.m.	$(40)_{10}$	32 49.8	117 18.4	0	19.6	2717	2583	2398	33.81
				June 27, 1908						
120	5:44 a.m.	40_{11}	32 54.4	117 21.5	0	18.6	2713	2579	2419	33.76
				June 29, 1908						
121	6:02 a.m.	41_7	32 37.3	117 25.7	0	18.3	.....	.....	.....	.....
122	7:30 a.m.	42_9	32 39.2	117 28.7	0	17.6	.....	.....	.....	.....
123	7:37 a.m.	42_9	32 39.4	117 28.9	0	17.7	.....	.....	.....	.....
124	7:52 a.m.	42_9	32 40.7	117 29.5	0	17.7	.....	.....	.....	.....
125	8:12 a.m.	42_8	32 41.2	117 29.6	0	17.7	.....	.....	.....	.....
126	8:31 a.m.	$42_{8.5}$	32 42.5	117 29.9	0	17.7	.....	.....	.....	.....
127	8:58 a.m.	42_9	32 43.5	117 30.0	0	17.8	.....	.....	.....	.....
128	9:37 a.m.	42_9	32 44.2	117 30.0	0	17.8	.....	.....	.....	.....
129	10:12 a.m.	42_9	32 45.1	117 30.0	0	18.5	.....	.....	.....	.....
130	10:43 a.m.	42_9	32 45.7	117 30.0	0	19.0	.....	.....	.....	.....
131	11:43 a.m.	42_9	32 45.1	117 30.9	0	19.5	.....	.....	.....	.....
132	12:35 p.m.	43_8	32 40.5	117 35.2	0	18.3	.....	.....	.....	.....
133	1:00 p.m.	43_8	32 40.2	117 35.1	0	18.3	.....	.....	.....	.....
134	1:22 p.m.	43_8	32 40.0	117 35.0	0	18.3	.....	.....	.....	.....
135	2:10 p.m.	43_8	32 39.2	117 35.7	0	18.5	.....	.....	.....	.....
136	2:40 p.m.	43_8	32 38.9	117 36.0	0	18.7	.....	.....	.....	.....
137	3:10 p.m.	43_8	32 38.5	117 36.2	0	19.0	.....	.....	.....	.....
138	3:38 p.m.	43_7	32 38.2	117 36.5	0	19.3	.....	.....	.....	.....
139	4:10 p.m.	43_7	32 37.3	117 36.6	0	19.4	.....	.....	.....	.....
140	4:39 p.m.	43_7	32 36.8	117 36.6	0	19.0	.....	.....	.....	.....
				June 30, 1908						
141	8:52 a.m.	40_{11}	32 54.4	117 21.5	0	18.5	.....	.....	.....	.....
142	2:05 p.m.	$(40)_{10}$	32 52.4	117 18.3	0	19.3	2713	2579	2402	33.76
143	2:35 p.m.	40_{11}	32 54.4	117 21.5	0	19.3	2711	2578	2400	33.74
144	2:55 p.m.	40_{11}	32 54.4	117 21.5	505	.....	2757	2621	.....	34.31K
				July 1, 1908						
145	3:50 a.m.	(39_{10})	32 51.6	117 17.4	0	19.0	2714	2580	2410	33.78
146	4:25 a.m.	40_{11}	32 52.7	117 20.2	0	18.7	2713	2579	2417	33.76
147	5:00 a.m.	41_{11}	32 54.4	117 24.3	0	19.5	2702	2569	2386	33.63
148	5:30 a.m.	42_{11}	32 55.8	117 28.0	0	19.3	2713	2579	2402	33.76
149	6:00 a.m.	$42_{11.5}$	32 57.5	117 31.9	0	19.3	2717	2583	2406	33.81
150	6:30 a.m.	43_{12}	32 59.3	117 36.6	0	19.3	2714	2580	2402	33.78
151	7:00 a.m.	44_{12}	33 0.7	117 39.9	0	18.75	2704	2571	2408	33.65
152	7:30 a.m.	45_{13}	33 2.6	117 44.3	0	17.0	2709	2576	2455	33.71
153	7:37 a.m.	45_{13}	33 2.9	117 45.5	0	17.2	2704	2571	2446	33.65
154	7:46 a.m.	45_{13}	33 3.5	117 46.7	0	17.0	2708	2575	2454	33.70
155	8:00 a.m.	46_{13}	33 4.1	117 48.2	0	16.8	2711	2577	2462	33.74
156	8:30 a.m.	46_{13}	33 5.7	117 52.4	0	17.0	2710	2577	2456	33.73
157	9:00 a.m.	47_{14}	33 7.7	117 57.3	0	16.5	2708	2575	2466	33.70
158	9:30 a.m.	48_{14}	33 9.4	118 1.6	0	17.0	2714	2580	2460	33.78
159	10:00 a.m.	49_{14}	33 10.0	118 3.8	0	16.9	2707	2574	2455	33.69
160	10:30 a.m.	50_{14}	33 11.2	118 7.8	0	16.9	2711	2578	2460	33.74
161	11:00 a.m.	50_{14}	33 11.3	118 8.1	0	17.3	2707	2574	2446	33.69
162	11:16 a.m.	50_{14}	33 11.3	118 8.1	365	.....	2748	2612	.....	34.20K
163	11:40 a.m.	50_{14}	33 10.8	118 8.7	0	17.1	2708	2575	2452	33.70
164	12:05 p.m.	50_{14}	33 11.0	118 9.8	0	16.9	2704	2571	2452	33.65
165	1:20 p.m.	50_{14}	33 11.3	118 10.9	0	16.7	2709	2576	2462	33.72
166	1:50 p.m.	50_{14}	33 12.4	118 10.8	0	17.3	2704	2571	2443	33.65
167	2:32 p.m.	50_{14}	33 10.2	118 10.6	0	16.5	2700	2567	2457	33.60
168	3:35 p.m.	50_{14}	33 8.5	118 12.4	0	16.1	2707	2574	2474	33.69
169	4:00 p.m.	51_{14}	33 11.7	118 14.4	0	16.0	2714	2580	2482	33.78

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° S / 4°0	Specific gravity: 17°5 S / 17°5	Specific gravity: t° S / 4°0	Salinity S ‰
				July 1, 1908						
170	4:30 p.m.	51_{15}	33° 14.6	118° 16.2	0	15.9	2715	2581	2487	33.79
171	4:58 p.m.	52_{16}	33 17.6	118 18.4	0	18.0	2719	2585	2440	33.84
172	5:25 p.m.	52_{16}	33 20.8	118 18.9	0	18.6	2715	2581	2422	33.79
				July 2, 1908						
173	6:00 a.m.	52_{15}	33 17.3	118 18.0	0	16.5	2709	2576	2467	33.71
174	6:30 a.m.	51_{15}	33 13.5	118 14.8	0	16.5	2714	2580	2472	33.78
175	7:00 a.m.	50_{14}	33 9.7	118 12.0	0	16.5	2705	2571	2462	33.66
176	7:30 a.m.	50_{13}	33 6.9	118 9.6	0	17.0	2706	2573	2451	33.68
177	8:00 a.m.	50_{13}	33 6.4	118 9.4	0	17.0	2708	2575	2454	33.70
178	9:00 a.m.	50_{13}	33 4.2	118 11.1	0	17.0	2703	2570	2449	33.64
179	9:45 a.m.	50_{13}	33 3.9	118 11.2	0	18.0	.....	.....	.....	.....
180	10:00 a.m.	50_{12}	33 2.3	118 12.3	0	17.5	2712	2579	2446	33.75
181	10:35 a.m.	51_{12}	32 58.2	118 14.9	0	17.2	2710	2577	2450	33.73
182	11:20 a.m.	51_{12}	32 58.4	118 13.6	0	17.0	.....	.....	.....	.....
183	12:13 p.m.	50_{12}	32 58.7	118 12.4	0	17.5	2697	2564	2432	33.56
184	12:55 p.m.	49_{12}	33 0.2	118 6.8	0	17.5	.....	.....	.....	.....
185	1:18 p.m.	48_{12}	33 1.0	118 2.3	0	17.5	2692	2559	2427	33.50?
186	2:16 p.m.	47_{12}	33 2.4	117 56.4	0	18.5	2708	2575	2419	33.70
187	2:50 p.m.	46_{13}	33 3.5	117 51.8	0	18.5	2703	2570	2413	33.64
188	3:14 p.m.	45_{13}	33 4.6	117 46.6	0	18.5	2709	2576	2418	33.71
189	3:30 p.m.	45_{13}	33 5.0	117 44.3	0	18.3	2704	2571	2419	33.65
190	4:05 p.m.	44_{13}	33 4.4	117 42.2	0	18.3	2709	2576	2424	33.71
191	4:40 p.m.	44_{13}	33 3.3	117 37.9	0	18.3	2705	2572	2419	33.66
192	5:05 p.m.	43_{13}	33 2.6	117 34.6	0	19.3	2708	2575	2398	33.70
193	5:40 p.m.	42_{12}	33 1.4	117 30.0	0	19.0	2723	2589	2418	33.89
194	6:22 p.m.	41_{12}	32 57.6	117 25.1	0	19.5	2714	2580	2398	33.78
				July 6, 1908						
195	9:10 a.m.	39_{7}	32 37.3	117 14.5	0	18.4	2720	2585	2432	33.85
196	9:50 a.m.	40_{8}	32 38.6	117 19.8	0	18.6	.....	.....	.....	.....
197	10:20 a.m.	41_{8}	32 39.3	117 23.5	0	18.7	2720	2585	2425	33.85
198	10:50 a.m.	41_{8}	32 40.3	117 27.4	0	19.3	2721	2586	2408	33.86
199	11:10 a.m.	42_{8}	32 40.9	117 30.3	0	19.3	2724	2589	2411	33.90
200	11:30 a.m.	43_{8}	32 41.4	117 32.6	0	18.9	2716	2582	2415	33.80
201	11:50 a.m.	43_{8}	32 42.1	117 35.3	0	19.3	2718	2584	2406	33.83
202	12:10 p.m.	44_{9}	32 42.8	117 39.0	0	20.0	2718	2584	2390	33.83
203	12:45 p.m.	44.5_{9}	32 43.7	117 42.5	0	20.2	2728	2593	2393	33.95?
204	12:55 p.m.	45_{9}	32 44.0	117 43.7	0	20.0	2721	2586	2391	33.86
205	1:05 p.m.	45_{8}	32 44.3	117 45.1	0	19.7	2726	2591	2404	33.93
206	1:30 p.m.	46_{8}	32 44.9	117 48.3	0	20.2	2719	2585	2384	33.84
207	1:50 p.m.	46_{8}	32 45.7	117 51.3	0	19.1	2721	2586	2416	33.86
208	2:10 p.m.	47_{9}	32 46.3	117 53.6	0	18.9	2713	2579	2413	33.76
209	2:30 p.m.	47_{7}	32 46.7	117 56.0	0	18.2	2718	2584	2435	33.83
210	2:50 p.m.	48_{9}	32 47.4	117 59.0	0	18.3	2717	2583	2432	33.81
211	3:13 p.m.	48_{10}	32 48.1	118 2.0	0	18.8	2727	2592	2428	33.94?
212	3:30 p.m.	49_{10}	32 48.7	118 4.5	0	18.75	2717	2583	2421	33.81
213	3:48 p.m.	49_{10}	32 48.8	118 5.9	0	19.2	.....	.....	.....	.....
214	4:10 p.m.	50_{10}	32 48.9	118 7.6	0	19.3	.....	.....	.....	.....
215	4:30 p.m.	50_{10}	32 48.9	118 10.2	0	18.5	2708	2575	2419	33.70
216	4:50 p.m.	51_{10}	32 48.8	118 13.3	0	18.5	2713	2579	2422	33.76
217	5:10 p.m.	51_{10}	32 48.8	118 16.2	0	18.6	.....	.....	.....	.....
218	5:30 p.m.	52_{7}	32 48.9	118 19.0	0	18.5	2726	2591	2434	33.92
219	5:50 p.m.	52_{10}	32 48.4	118 21.5	0	18.2	.....	.....	.....	.....
				July 7, 1908						
220	3:50 a.m.	53_{9}	32 48.8	118 23.5	0	18.2	.....	.....	.....	.....
221	4:50 a.m.	53_{7}	32 47.4	118 25.7	0	17.5	.....	.....	.....	.....
222	5:30 a.m.	53_{7}	32 46.0	118 23.5	0	17.6	.....	.....	.....	.....
223	6:00 a.m.	52_{10}	32 48.1	118 21.9	0	17.8	2714	2580	2440	33.78
224	6:20 a.m.	52_{10}	32 49.2	118 18.4	0	17.7	2720	2585	2449	33.85
225	6:39 a.m.	52_{7}	32 46.8	118 20.3	0	17.5	2709	2576	2443	33.71
226	7:30 a.m.	52_{7}	32 46.4	118 20.6	0	17.6	2717	2583	2448	33.81
227	10:30 a.m.	52_{7}	32 45.6	118 20.5	0	19.1	.....	.....	.....	.....
228	11:30 a.m.	52_{7}	32 45.8	118 19.6	0	17.5	.....	.....	.....	.....
229	12:30 p.m.	52_{9}	32 45.8	118 19.0	0	18.2	.....	.....	.....	.....

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position		Depth in meters	Temperature in centigrade	Specific gravity			Salinity S ‰
			North latitude	West longitude			S 0°/4°0	S 17°5/17°5	S t°/4°0	
				July 8, 1908						
230	8:07 a.m.	52_{10}	32° 48′1	118° 19′9	825	.....	2777	2640	.....	34.56K
231	10:00 a.m.	52_{10}	32 50.8	118 20.1	0	17.75	2722	2588	2449	33.87
232	10:30 a.m.	52_{11}	32 54.5	118 19.8	0	18.0	.....	.....	.....	.....
233	11:10 a.m.	52_{12}	32 59.3	118 19.5	0	17.8	2720	2585	2447	33.85
234	11:40 a.m.	52_{13}	33 3.8	118 19.2	0	17.6	2722	2588	2453	33.87
235	12:10 p.m.	$52_{13.5}$	33 7.5	118 18.8	0	17.8	2722	2588	2448	33.87
236	12:45 p.m.	52_{14}	33 12.0	118 18.5	0	18.0	2718	2584	2440	33.83
237	1:15 p.m.	52_{15}	33 15.5	118 18.3	0	19.0	2716	2582	2412	33.80
237*a*	7:37 p.m.	52_{16}	33 21.9	118 19.1	0	18.9	.....	.....	.....	.....
				July 9, 1908						
238	6:40 a.m.	52_{15}	33 16.5	118 19.7	0	18.5	2716	2582	2426	33.80
239	7:15 a.m.	52_{15}	33 13.4	118 22.3	0	18.3	2719	2585	2433	33.84
240	7:45 a.m.	53_{14}	33 10.7	118 24.8	0	18.3	2718	2584	2432	33.83
241	8:15 a.m.	53_{14}	33 8.0	118 27.1	0	17.7	2715	2581	2444	33.79
242	8:46 a.m.	54_{13}	33 4.7	118 29.8	0	17.7	2718	2584	2447	33.83
243	9:15 a.m.	54_{12}	33 2.0	118 32.3	0	17.7	2718	2584	2447	33.83
244	9:45 a.m.	55_{12}	33 0.6	118 33.2	0	18.0	2705	2572	2427	33.66
				July 10, 1908						
245	7:17 a.m.	50_{11}	32 53.4	118 10.2	825	.....	2777	2640	.....	34.56K
246	10:34 a.m.	50_{11}	32 53.4	118 9.1	135	9.9	2756	2620	2642	34.30K
247	10:50 a.m.	50_{11}	32 53.5	118 7.8	0	18.5	2721	2587	2431	33.86
248	10:59 a.m.	49_{11}	32 53.5	118 7.4	640	.....	2770	2633	.....	34.47K
				July 11, 1908						
249	1:25 a.m.	53_9	32 46.9	118 26.5	0	17.5	2714	2580	2448	33.78
250	1:45 a.m.	54_9	32 45.5	118 28.8	0	17.5	2718	2584	2453	33.83
251	2:05 a.m.	54_9	32 43.4	118 32.3	0	17.5	2719	2585	2453	33.84
252	2:25 a.m.	$55_{8.5}$	32 42.5	118 33.7	0	17.5	2718	2584	2453	33.83
253	2:45 a.m.	55_8	32 41.0	118 36.0	0	17.5	2723	2589	2456	33.89
254	3:05 a.m.	56_8	32 39.4	118 38.7	0	17.5	2725	2591	2459	33.91
255	3:30 a.m.	56_7	32 37.3	118 42.2	0	17.5	2721	2587	2454	33.86
256	3:50 a.m.	57_7	32 35.7	118 44.7	0	17.5	2723	2589	2457	33.89
257	4:10 a.m.	57_7	32 34.2	118 47.2	0	17.2	2712	2578	2453	33.75
258	4:30 a.m.	58_7	32 33.0	118 49.0	0	15.4	2719	2585	2502	33.84
259	4:50 a.m.	58_8	32 31.2	118 51.8	0	15.4	2723	2589	2506	33.89
260	5:10 a.m.	59_8	32 30.2	118 53.6	0	15.5	2715	2581	2496	33.79
261	5:30 a.m.	59_8	32 28.7	118 56.0	0	15.4	2711	2578	2494	33.74
262	5:50 a.m.	60_8	32 27.1	118 58.6	0	15.3	2724	2590	2509	33.90
263	6:10 a.m.	60_5	32 25.7	119 0.8	0	15.3	2721	2587	2506	33.86
264	6:26 a.m.	61_5	32 24.5	119 2.8	0	15.3	2711	2578	2496	33.74
265	6:41 a.m.	61_5	32 23.2	119 4.9	0	15.3	2725	2591	2508	33.91
266	7:08 a.m.	61_4	32 21.9	119 6.8	0	15.3	2721	2587	2506	33.86
267	8:08 a.m.	62_4	32 22.0	119 7.8	0	15.6	2722	2588	2502	33.87
268	9:10 a.m.	62_5	32 24.2	119 8.9	0	15.6	2726	2591	2504	33.92
269	9:30 a.m.	61_5	32 25.5	119 6.1	0	15.5	2726	2591	2506	33.92
270	9:50 a.m.	61_5	32 26.4	119 3.8	0	15.4	2720	2585	2503	33.85
271	11:02 a.m.	59_6	32 30.9	118 54.1	0	15.5	2721	2587	2501	33.86
272	11:20 a.m.	58_6	32 32.1	118 51.4	0	15.5	2722	2588	2502	33.87
273	11:40 a.m.	58_7	32 33.7	118 47.7	0	15.5	2716	2582	2497	33.80
274	12:35 p.m.	56_7	32 36.4	118 42.0	0	16.0	2723	2589	2492	33.89
275	12:50 p.m.	56_8	32 38.0	118 38.3	0	18.0	2718	2584	2440	33.83
276	1:10 p.m.	55_8	32 39.9	118 34.0	0	18.2	2722	2588	2438	33.87
277	1:30 p.m.	54_8	32 41.6	118 32.0	0	18.3	2706	2573	2421	33.68
278	1:50 p.m.	54_9	32 43.3	118 29.8	0	18.1	2708	2575	2428	33.70
279	2:10 p.m.	53_9	32 46.4	118 26.1	0	17.7	2709	2576	2438	33.71
280	2:30 p.m.	53_{10}	32 49.0	118 23.2	0	17.3	2714	2580	2453	33.78
				July 12, 1908						
281	5:30 a.m.	53_{10}	32 48.8	118 23.0	0	17.6	2719	2585	2450	33.84
282	6:20 a.m.	52_{10}	32 48.7	118 17.8	0	18.3	2710	2576	2424	33.73
283	6:40 a.m.	51_{10}	32 48.7	118 15.0	0	17.5	2711	2577	2445	33.74
284	7:00 a.m.	50_{10}	32 48.7	118 12.0	0	17.9	2716	2582	2439	33.80
285	7:40 a.m.	49_{10}	32 48.6	118 6.3	0	17.5	2713	2579	2446	33.76
286	8:00 a.m.	49_{10}	32 48.6	118 3.2	0	18.2	2715	2581	2431	33.79
287	8:20 a.m.	48_{10}	32 48.6	118 0.6	0	18.3	2717	2583	2431	33.81
288	8:40 a.m.	47_{10}	32 48.5	117 57.4	0	19.5	2710	2577	2394	33.73
289	9:00 a.m.	47_{10}	32 48.6	117 54.4	0	19.7	2714	2580	2392	33.78

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° / 4°0	Specific gravity: 17°5 / 17°5	Specific gravity: t° / 4°0	Salinity S ‰
				July 12, 1908						
290	9:20 a.m.	46_{10}	32° 48.5	117° 51.3	0	19.6	2714	2580	2396	33.78
291	9:40 a.m.	46_{10}	32 48.5	117 48.3	0	19.0	2711	2577	2408	33.74
292	10:00 a.m.	45_{10}	32 48.4	117 45.4	0	18.8	2719	2585	2421	33.84
293	10:20 a.m.	44_{10}	32 48.3	117 41.9	0	18.5	2711	2578	2420	33.74
294	10:40 a.m.	44_{10}	32 48.2	117 38.9	0	18.5	2705	2572	2415	33.66
295	11:00 a.m.	43_{10}	32 48.2	117 36.2	0	18.5	2717	2583	2427	33.81
296	11:20 a.m.	43_{10}	32 48.0	117 33.0	0	18.8	2711	2578	2412	33.74
297	11:50 a.m.	42_{10}	32 47.9	117 28.4	0	19.8	2720	2585	2396	33.85
298	12:13 p.m.	41_{10}	32 47.8	117 25.0	0	20.1	.....	.....	.....	.....
299	12:35 p.m.	$(40)_{10}$	32 49.0	117 21.0	0	19.1	2715	2581	2410	33.79
300	1:20 p.m.	(39_{10})	32 51.3	117 16.5	0	19.5	2719	2585	2403	33.84
				July 16, 1908						
301	1:42 a.m.	39_7	32 37.4	117 14.6	0	19.5	.....	.....	.....	.....
302	2:00 a.m.	(39_8)	32 37.9	117 17.1	0	19.3	2720	2586	2409	33.85
303	2:20 a.m.	40_8	32 38.2	117 19.5	0	18.5	2719	2585	2429	33.84
304	2:40 a.m.	40_8	32 38.7	117 22.2	0	19.5	2724	2589	2408	33.90
305	3:00 a.m.	41_8	32 39.1	117 24.8	0	19.6	2722	2588	2403	33.88
306	3:20 a.m.	41_8	32 39.5	117 27.3	0	20.0	2723	2588	2391	33.89
307	4:00 a.m.	42_8	32 40.3	117 32.0	0	19.5	2713	2579	2396	33.76
308	4:30 a.m.	43_8	32 40.8	117 34.5	0	19.3	2720	2586	2409	33.85
309	4:40 a.m.	43_8	32 41.0	117 35.9	0	19.2	2722	2588	2413	33.88
310	5:00 a.m.	44_8	32 41.5	117 39.1	0	19.0	2718	2584	2414	33.83
311	5:20 a.m.	44_8	32 42.0	117 41.5	0	19.0	2717	2583	2413	33.81
312	5:40 a.m.	45_8	32 42.3	117 43.5	0	19.2	2705	2572	2396	33.66
313	6:00 a.m.	45_9	32 42.7	117 45.9	0	19.3	2721	2587	2409	33.86
314	6:20 a.m.	46_9	32 43.1	117 48.3	0	19.5	2727	2592	2410	33.94
315	6:40 a.m.	46_9	32 43.6	117 51.2	0	19.4	2727	2592	2413	33.94
316	7:00 a.m.	47_9	32 43.8	117 52.8	0	19.2	2717	2583	2407	33.81
317	7:20 a.m.	47_9	32 44.4	117 55.6	0	18.5	2724	2589	2433	33.90
318	7:40 a.m.	48_9	32 45.1	117 59.8	0	18.5	2724	2589	2433	33.90
319	8:00 a.m.	48_9	32 45.3	118 1.5	0	18.5	2712	2578	2421	33.75
320	8:20 a.m.	49_9	32 46.0	118 4.4	0	19.0	2714	2580	2411	33.78
321	8:40 a.m.	49_9	32 46.7	118 7.3	0	18.6	2728	2593	2428	33.95?
322	9:00 a.m.	50_8	32 47.2	118 10.1	0	18.6	2713	2579	2420	33.76
323	9:20 a.m.	50_{10}	32 47.8	118 12.3	0	19.3	2718	2584	2407	33.83
324	10:05 a.m.	51_{10}	32 48.7	118 14.5	640	.....	2761	2625	.....	34.36K
325	1:15 p.m.	51_{10}	32 48.7	118 14.5	0	18.6	2710	2576	2417	33.73
				July 17, 1908						
326	1:40 a.m.	53_{10}	32 48.5	118 24.0	0	18.1	.....	.....	.....	.....
327	2:00 a.m.	53_9	32 46.7	118 26.9	0	18.7	2705	2572	2410	33.66
328	2:20 a.m.	54_9	32 45.2	118 29.4	0	18.5	2716	2582	2426	33.80
329	2:40 a.m.	54_9	32 43.5	118 32.0	0	18.5	.....	.....	.....	.....
330	3:00 a.m.	55_8	32 41.8	118 34.7	0	18.5	2703	2570	2412	33.64
331	3:20 a.m.	55_8	32 40.2	118 37.4	0	18.5	2709	2575	2418	33.71
332	3:40 a.m.	56_8	32 39.4	118 38.8	0	18.5	2705	2572	2415	33.66
333	4:00 a.m.	56_7	32 37.3	118 42.1	0	18.1	2709	2575	2428	33.71
334	4:20 a.m.	57_7	32 35.7	118 44.7	0	18.3	2710	2576	2425	33.73
335	4:40 a.m.	57.5_7	32 34.0	118 47.5	0	18.1	2708	2574	2427	33.70
336	5:00 a.m.	58_8	32 32.4	118 50.0	0	18.0	2710	2576	2432	33.73
337	5:20 a.m.	59_8	32 30.8	118 52.6	0	16.5	2707	2574	2464	33.69
338	5:40 a.m.	59_6	32 29.3	118 55.0	0	16.0	2709	2575	2478	33.71
339	6:00 a.m.	60_6	32 29.7	118 57.6	0	16.1	2698	2565	2466	33.58
340	6:20 a.m.	60_8	32 26.0	119 0.5	0	16.3	2691	2558	2455	33.49
341	6:40 a.m.	61_8	32 24.5	119 2.8	0	16.4	2695	2562	2458	33.54
342	7:00 a.m.	61_5	32 23.0	119 5.2	0	16.7	2688	2555	2442	33.45
343	9:30 a.m.	61_5	32 23.5	119 5.8	0	17.0	2697	2564	2443	33.57
344	1:16 p.m.	61_8	32 23.7	119 6.0	0	18.5	.....	.....	.....	.....
345	2:09 p.m.	61_8	32 23.7	119 6.0	0	18.3	2694	2561	2442	33.53
346	2:52 p.m.	61_5	32 24.2	119 6.2	0	17.5	2691	2558	2427	33.49
				July 18, 1908						
347	7:07 a.m.	61_5	32 24.2	119 6.2	0	16.5	2694	2561	2451	33.53
348	9:32 a.m.	61_5	32 24.2	119 6.2	0	17.5	2700	2567	2435	33.60
349	10:00 a.m.	61_5	32 25.6	119 4.3	0	17.9	2686	2553	2415	33.43
350	10:20 a.m.	60_5	32 27.2	119 1.7	0	18.3	....	.....	....	.....
351	10:40 a.m.	60_6	32 28.6	118 59.5	0	18.5	2698	2565	2410	33.58

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position		Depth in meters	Temperature in centigrade	Specific gravity			S ‰ Salinity
			North latitude	West longitude			S 0°/4°0	S 17°5/17°5	S t°/4°0	
				July 18, 1908						
352	11:00 a.m.	59_{5}	32° 30.2	118° 57.0	0	18°5	2694	2561	2406	33.53
353	11:20 a.m.	59_{0}	32 31.6	118 54.7	0	19.1	2706	2573	2400	33.68
354	11:40 a.m.	58_{5}	32 33.1	118 52.3	0	19.5	2699	2566	2382	33.59
355	12:01 p.m.	58_{0}	32 34.1	118 50.6	0	19.8	2708	2574	2385	33.70
356	12:20 p.m.	57_{7}	32 36.2	118 47.4	0	19.5	2697	2564	2381	33.57
357	12:40 p.m.	57_{5}	32 37.7	118 45.0	0	20.1	2717	2583	2385	33.81
358	1:00 p.m.	57_{0}	32 39.2	118 42.7	0	21.5	2713	2579	2343	33.76
359	1:20 p.m.	56_{5}	32 40.6	118 40.2	0	21.3	2714	2580	2349	33.78
360	1:40 p.m.	56_{0}	32 42.2	118 37.7	0	20.7	.....	.....	.....	.....
361	2:00 p.m.	55_{5}	32 43.7	118 35.4	0	20.9	.....	.....	.....	.....
362	2:20 p.m.	55_{0}	32 44.8	118 33.5	0	21.0	2711	2577	2355	33.74
363	2:40 p.m.	54_{5}	32 46.0	118 30.2	0	20.3	2713	2579	2376	33.76
364	3:00 p.m.	54_{0}	32 47.2	118 27.6	0	20.5	2708	2574	2365	33.70
365	4:40 p.m.	52_{10}	32 48.6	118 19.2	0	19.0	2717	2583	2413	33.81
366	5:00 p.m.	51_{10}	32 48.5	118 16.7	0	20.1	2706	2573	2375	33.68
367	5:40 p.m.	50_{10}	32 48.3	118 11.4	0	20.2	2713	2579	2380	33.76
368	6:00 p.m.	50_{10}	32 48.3	118 8.2	0	20.4	2706	2573	2366	33.68
369	6:20 p.m.	49_{10}	32 48.2	118 5.3	0	20.2	2713	2579	2380	33.76
370	6:40 p.m.	48.5_{10}	32 48.2	118 2.5	0	19.9	2718	2584	2392	33.83
371	7:00 p.m.	48_{10}	32 48.1	118 0.2	0	19.7	2714	2580	2393	33.78
372	7:20 p.m.	47_{10}	32 48.0	117 57.4	0	19.8	.....	.....	.....	.....
373	7:40 p.m.	47_{10}	32 48.0	117 55.0	0	19.5	2704	2571	2388	33.65
374	8:00 p.m.	46_{10}	32 47.9	117 51.8	0	19.5	2709	2575	2394	33.71
375	8:20 p.m.	46_{10}	32 47.9	117 49.0	0	19.5	2704	2571	2388	33.65
376	8:40 p.m.	45_{10}	32 47.9	117 46.5	0	19.5	2703	2570	2387	33.64
377	9:00 p.m.	45_{10}	32 47.8	117 43.4	0	19.6	2707	2574	2388	33.69
378	9:20 p.m.	44_{10}	32 47.6	117 40.4	0	19.7	2699	2566	2378	33.59
379	9:40 p.m.	43_{10}	32 47.6	117 37.2	0	20.3	.....	.....	.....	.....
380	10:00 p.m.	43.5_{5}	32 47.5	117 35.3	0	20.3	2695	2562	2357	33.54
381	10:20 p.m.	42.5_{0}	32 47.4	117 32.5	0	20.1	2699	2566	2367	33.59
382	10:40 p.m.	42_{5}	32 47.3	117 29.8	0	20.4	2702	2569	2362	33.63
				July 21, 1908						
383	10:00 a.m.	41_{11}	32 56.9	117 25.8	0	21.5	2710	2576	2341	33.73
384	10:30 a.m.	41_{11}	32 53.0	117 26.8	0	21.5	2702	2569	2333	33.63
385	11:00 a.m.	42_{10}	32 49.6	117 28.8	0	21.3	2703	2570	2340	33.64
386	11:29 a.m.	42_{10}	32 49.6	117 28.8	640	.....	2754	2618	.....	34.27K
387	11:30 a.m.	42_{10}	32 49.6	117 28.8	0	21.5	2705	2572	2335	33.66
388	11:47 a.m.	42_{10}	32 49.6	117 28.8	460	.....	2746	2610	.....	34.17K
389	12:01 p.m.	42_{10}	23 49.6	117 28.8	0	21.5	2699	2566	2329	33.59
390	12:30 p.m.	42_{10}	32 49.6	117 28.8	0	21.5	2699	2566	2329	33.59
391	12:40 p.m.	42_{10}	32 49.6	117 28.8	135	.....	2734	2599	.....	34.02K
392	12:58 p.m.	42_{11}	32 49.6	117 28.8	275	9.6	2748	2612	2462	34.20K
393	1:00 p.m.	42_{10}	32 49.6	117 28.8	0	21.5	2708	2574	2339	33.70
394	1:30 p.m.	42_{11}	32 49.6	117 28.8	0	22.0	2703	2570	2321	33.64
395	3:00 p.m.	42_{10}	32 49.6	117 28.8	0	22.3	2710	2576	2318	33.73
396	3:30 p.m.	41_{11}	32 49.9	117 26.8	0	22.5	2708	2574	2310	33.70
397	4:00 p.m.	$(40)_{10}$	32 50.6	117 22.9	0	22.1	2712	2578	2326	33.75
				July 22, 1908						
398	6:30 a.m.	41_{10}	32 50.2	117 25.5	0	20.4	2692	2559	2354	33.50
399	7:00 a.m.	42_{11}	32 49.7	117 30.2	0	21.3	2704	2571	2340	33.65
400	7:30 a.m.	42_{10}	32 49.4	117 34.4	0	21.5	2706	2573	2337	33.68
401	8:00 a.m.	42_{10}	32 50.1	117 34.0	0	20.5	2709	2575	2366	33.71
402	8:30 a.m.	43_{10}	32 50.6	117 33.7	0	20.5	2701	2568	2358	33.61
403	9:00 a.m.	43_{10}	32 51.4	117 33.3	0	21.0	2705	2572	2349	33.66
404	9:30 a.m.	43_{10}	32 52.0	117 33.0	0	21.1	2698	2565	2340	33.58
405	10:00 a.m.	43_{11}	32 52.6	117 32.6	0	21.3	2704	2571	2340	33.65
406	10:30 a.m.	42_{11}	32 53.3	117 32.3	0	21.5	2706	2572	2336	33.68
407	11:00 a.m.	42_{11}	32 53.8	117 31.8	0	21.5	2704	2571	2334	33.65
408	11:30 a.m.	42_{11}	32 54.4	117 31.3	0	21.7	2709	2575	2335	33.71
409	12:01 p.m.	42_{11}	32 55.0	117 30.8	0	22.3	2706	2573	2316	33.68
410	12:30 p.m.	42_{11}	32 55.6	117 30.4	0	22.5	2704	2571	2307	33.65
411	1:00 p.m.	42_{11}	32 56.3	117 29.8	0	22.5	2705	2572	2308	33.66
412	1:30 p.m.	42_{11}	32 56.9	117 29.3	0	22.5	2704	2571	2307	33.65
413	2:00 p.m.	42_{12}	32 57.6	117 28.8	0	22.1	2707	2574	2321	33.69

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: S 0°/4°0	Specific gravity: S 17°5/17°5	Specific gravity: S t°/4°0	Salinity S ‰
				July 22, 1908						
414	7:00 p.m.	$(40)_{10}$	32° 51.4	117° 17.8	0	20°3	2711	2577	2375	33.74
415	7:20 p.m.	$(40)_{10}$	32 51.5	117 20.7	0	20.3	2708	2574	2371	33.70
416	7:40 p.m.	$(40)_{10}$	32 51.5	117 21.4	0	20.3	2715	2581	2379	33.79
417	8:00 p.m.	$(40)_{10}$	32 51.6	117 22.3	0	20.5	2710	2576	2368	33.73
418	8:20 p.m.	$(40)_{10}$	32 51.9	117 21.6	0	20.5	2711	2577	2368	33.74
419	8:40 p.m.	$(40)_{10}$	32 52.2	117 20.6	0	20.5	2718	2584	2375	33.83
				July 23, 1908						
420	4:02 a.m.	$(40)_{10}$	32 51.4	117 19.3	0	20.0	2711	2576	2382	33.74
421	4:20 a.m.	$(40)_{10}$	32 51.5	117 22.0	0	19.9	2711	2576	2384	33.74
422	5:30 a.m.	$(40)_{10}$	32 52.1	117 20.2	0	19.7	2709	2575	2387	33.71
423	5:50 a.m.	$(40)_{10}$	32 51.8	117 19.0	0	19.8	2713	2579	2389	33.76
424	7:30 p.m.	$(40)_{10}$	32 51.6	117 19.4	0	22.2	2717	2583	2328	33.81
425	8:00 p.m.	$(40)_{10}$	32 51.7	117 20.7	0	20.5	2705	2572	2361	33.66
426	8:30 p.m.	$(40)_{10}$	32 51.8	117 22.0	0	20.7	2707	2574	2358	33.69
427	9:00 p.m.	$(40)_{10}$	32 52.0	117 19.4	0	20.5	2699	2566	2356	33.59
				July 24, 1908						
428	3:50 a.m.	$(40)_{10}$	32 51.5	117 18.6	0	20.3	2709	2575	2372	33.71
429	4:15 a.m.	$(40)_{10}$	32 51.5	117 21.4	0	20.5	2697	2564	2355	33.56
430	4:35 a.m.	$(40)_{10}$	32 51.4	117 22.2	0	20.5	2705	2572	2361	33.66
431	4:55 a.m.	$(41)_{10}$	32 51.5	117 22.6	0	20.5	2707	2574	2364	33.69
432	5:15 a.m.	$(40)_{10}$	32 51.2	117 22.2	0	20.5	2704	2571	2361	33.65
433	5:35 a.m.	$(40)_{10}$	32 51.3	117 20.8	0	20.5	2709	2575	2366	33.71
				Aug. 26, 1908						
434	8:00 a.m.	$(38)_6$	32 28.5	117 11.7	0	16.25	2712	2579	2475	33.75h
435	8:20 a.m.	38_5	32 26.5	117 12.1	0	16.36	.....	.....	.....	.....
436	8:40 a.m.	38_5	32 23.1	117 12.7	0	17.25	2724	2589	2464	33.90h
437	9:00 a.m.	39_4	32 21.0	117 13.2	0	17.9	2720	2586	2444	33.85h
438	9:20 a.m.	39_4	32 18.8	117 13.7	0	18.05	.....	.....	.....	.....
439	9:40 a.m.	39_3	32 16.5	117 14.3	0	18.7	.....	.....	.....	.....
440	10:00 a.m.	39_3	32 14.6	117 14.8	0	18.8	2706	2573	2407	33.68h
441	10:20 a.m.	39_3	32 13.1	117 15.4	0	20.2	.....	.....	.....	.....
442	10:40 a.m.	39_2	32 10.4	117 15.9	0	20.3	.....	.....	.....	.....
443	11:00 a.m.	39_2	32 8.8	117 16.4	0	20.45	2725	2590	2382	33.91h
444	11:20 a.m.	39_1	32 6.0	117 17.1	0	20.95	.....	.....	.....	.....
445	11:40 a.m.	40_1	32 3.5	117 17.6	0	21.45	.....	.....	.....	.....
446	12:01 p.m.	40_1	32 2.7	117 18.2	0	21.85	.....	.....	.....	.....
447	12:20 p.m.	40_0	32 0.0	117 19.2	0	21.6	2719	2585	2347	33.84h
448	12:40 p.m.	40_0	31 58.6	117 19.4	0	21.13	2722	2588	2362	33.88h
449	1:00 p.m.	40^1	31 56.9	117 19.7	0	21.42	2727	2592	2360	33.94h
450	1:20 p.m.	40^1	31 53.8	117 19.9	0	21.2	2714	2580	2353	33.78h
451	1:40 p.m.	40^2	31 51.9	117 20.2	0	20.6	2705	2572	2360	33.66h
452	2:00 p.m.	40^2	31 50.0	117 20.4	0	20.38	2726	2591	2385	33.93h
453	2:20 p.m.	40^3	31 46.9	117 20.8	0	20.2	.....	.....	.....	.....
454	2:40 p.m.	40^3	31 44.6	117 21.1	0	19.95	.....	.....	.....	.....
455	3:00 p.m.	40^3	31 42.9	117 21.4	0	19.5	2717	2583	2401	33.81h
456	3:20 p.m.	40^4	31 40.0	117 21.8	0	19.8	2730	2595	2405	33.98h
457	3:40 p.m.	40^4	31 38.5	117 20.1	0	19.78	.....	.....	.....	.....
458	4:00 p.m.	40.5^5	31 36.1	117 22.5	0	20.1	.....	.....	.....	.....
459	4:20 p.m.	41^6	31 32.1	117 22.9	0	21.0	.....	.....	.....	.....
460	4:40 p.m.	41^6	31 31.1	117 23.3	0	20.0	.....	.....	.....	.....
461	5:00 p.m.	41^6	31 29.6	117 23.7	0	20.1	2720	2586	2388	33.85h
462	5:20 p.m.	41^7	31 27.1	117 24.2	0	20.1	2727	2592	2395	33.94h
463	5:40 p.m.	41^7	31 25.4	117 24.7	0	20.0	.....	.....	.....	.....
464	6:00 p.m.	41^7	31 22.7	117 25.4	0	20.0	.....	.....	.....	.....
465	6:20 p.m.	41^8	31 21.5	117 26.0	0	19.9	.....	.....	.....	.....
466	6:40 p.m.	41^8	31 20.0	117 26.6	0	19.9	.....	.....	.....	.....
467	7:00 p.m.	41^8	31 18.8	117 27.1	0	19.3	.....	.....	.....	.....
468	7:20 p.m.	41^8	31 18.8	117 27.1	0	19.3	.....	.....	.....	.....
469	7:40 p.m.	41^9	31 14.6	117 27.1	0	19.6	.....	.....	.....	.....
470	8:00 p.m.	41^9	31 14.2	117 27.3	0	19.1	2727	2592	2420	33.94h
471	8:20 p.m.	42^{10}	31 12.1	117 27.6	0	18.9	2702	2569	2402	33.63h
472	8:40 p.m.	42^{10}	31 10.0	117 27.9	0	18.8	2698	2565	2402	33.58h
473	9:00 p.m.	42^{10}	31 8.5	117 28.2	0	19.1	2712	2578	2407	33.75h
474	9:20 p.m.	42^{11}	31 5.4	117 28.5	0	19.1	2703	2570	2398	33.64h

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position		Depth in meters	Temperature in centigrade	Specific gravity			Salinity S ‰
			North latitude	West longitude			0° S 4°0	17°5 S 17°5	4° S 4°0	
				Aug. 26, 1908						
475	9:40 p.m.	42^{11}	31° 3.1	117° 28.9	0	19°2	2700	2567	2391	33.60h
476	10:00 p.m.	42^{12}	31 1.5	117 29.2	0	19.1	2720	2586	2411	33.85h
477	10:20 p.m.	42^{13}	30 58.1	117 29.6	0	19.0	2687	2554	2386	33.44h
478	10:40 p.m.	42^{14}	30 57.1	117 30.0	0	19.0	2707	2574	2404	33.69h
479	11:00 p.m.	42^{15}	30 55.0	117 30.4	0	18.9	2702	2569	2401	33.63h
480	11:20 p.m.	42^{16}	30 53.5	117 30.8	0	18.8	2703	2570	2405	33.64h
481	11:40 p.m.	42^{17}	30 50.8	117 31.2	0	18.7	2718	2584	2422	33.83h
482	11:59 p.m.	42^{18}	30 48.5	117 31.7	0	18.7	2687	2554	2394	33.44h
				Aug. 27, 1908						
483	12:20 a.m.	42^{19}	30 46.9	117 32.1	0	18.5	2721	2587	2428	33.86h
484	12:40 a.m.	42.5^{19}	30 44.6	117 32.5	0	18.4	.....	.....	.....	...
485	1:00 a.m.	43^{20}	30 42.7	117 32.9	0	18.4	2700	2567	2411	33.60h
486	1:20 a.m.	43^{21}	30 40.4	117 33.3	0	18.4	2701	2568	2412	33.61h
487	1:40 a.m.	43^{22}	30 37.1	117 33.8	0	18.3	2685	2552	2402	33.42h
488	2:00 a.m.	43^{23}	30 35.8	117 33.9	0	18.3	2723	2588	2438	33.89h
489	2:20 a.m.	43^{24}	30 33.8	117 34.2	0	18.3	2704	2571	2419	33.65h
490	2:40 a.m.	43^{25}	30 31.1	117 34.3	0	18.3	2707	2574	2422	33.69h
491	3:00 a.m.	43^{26}	30 29.2	117 34.5	0	18.3	2692	2559	2409	33.50h
492	3:20 a.m.	43^{27}	30 26.5	117 34.6	0	18.4	2732	2597	2443	34.00h
493	3:40 a.m.	43^{28}	30 25.4	117 35.1	0	18.4	2681	2549	2395	33.37h
494	4:00 a.m.	43^{29}	30 22.1	117 35.6	0	18.6	2697	2564	2406	33.55h
495	4:20 a.m.	43^{30}	30 20.4	117 36.1	0	18.8	.....	....	....	....
496	4:40 a.m.	43^{30}	30 17.7	117 36.6	0	18.6	.....	....	.....	...
497	5:00 a.m.	43^{31}	30 15.8	117 37.1	0	18.9	2719	2585	2419	33.84h
498	5:20 a.m.	44^{31}	30 13.8	117 37.6	0	18.9	2709	2575	2409	33.71h
499	5:40 a.m.	44^{32}	30 12.1	117 38.1	0	18.9	2715	2581	2415	33.79h
500	6:00 a.m.	44^{32}	30 10.0	117 38.6	0	18.7	2718	2584	2423	33.83h
501	6:20 a.m.	44^{32}	30 7.7	117 39.1	0	18.8	2712	2578	2413	33.75h
502	6:40 a.m.	44^{33}	30 5.0	117 39.6	0	18.7	2724	2589	2429	33.90h
503	7:00 a.m.	44^{34}	30 3.5	117 39.7	0	18.9	2688	2555	2390	33.15h
504	7:20 a.m.	44^{34}	30 1.1	117 39.8	0	18.9	.....	.....	.....	...
505	7:40 a.m.	44^{34}	29 58.8	117 39.8	0	18.8	2718	2584	2420	33.83h
506	8:00 a.m.	44^{35}	29 57.2	117 39.9	0	18.8	2722	2588	2423	33.88h
507	8:20 a.m.	44^{35}	29 55.0	117 40.0	0	18.9	2713	2579	2413	33.76h
508	8:40 a.m.	44^{36}	29 52.1	117 40.6	0	19.0	.....	.....	.....	...
509	9:00 a.m.	44^{36}	29 49.2	117 41.2	0	18.95	2713	2579	2410	33.76h
510	9:20 a.m.	44^{36}	29 48.5	117 41.8	0	19.0	2721	2587	2417	33.86h
511	9:40 a.m.	44^{37}	29 45.4	117 42.4	0	19.0	2723	2588	2418	33.89h
512	10:00 a.m.	45^{37}	29 42.7	117 42.9	0	19.0	2705	2572	2402	33.66h
513	10:20 a.m.	45^{38}	29 40.8	117 43.5	0	19.0	2729	2594	2424	33.96h
514	10:40 a.m.	45^{39}	29 36.5	117 44.0	0	19.0	.....	.....	.....	...
515	11:00 a.m.	45^{39}	29 35.4	117 44.6	0	18.9	.....	.....	.....	...
516	11:20 a.m.	45^{39}	29 32.7	117 45.1	0	18.8	2703	2570	2405	33.64h
517	11:40 a.m.	45^{39}	29 31.1	117 45.7	0	18.6	2721	2587	2428	33.86h
518	12:01 p.m.	45^{39}	29 28.5	117 46.2	0	18.4	2704	2581	2415	33.65h
519	12:20 p.m.	45.5^{39}	29 27.7	117 47.5	0	18.4	2714	2580	2425	33.78h
520	12:40 p.m.	46^{39}	29 23.1	117 51.2	0	18.4	2692	2559	2406	33.50h
521	1:00 p.m.	46.5^{39}	29 21.1	117 52.5	0	18.2	2708	2574	2424	33.70h
522	1:20 p.m.	47^{39}	29 18.1	117 54.2	0	18.2	.....	.....	.....	...
523	1:40 p.m.	47^{39}	29 16.5	117 55.8	0	18.3	2708	2574	2423	33.70h
524	2:00 p.m.	47.5^{39}	29 13.8	117 57.5	0	18.2	2711	2577	2429	33.74h
525	2:20 p.m.	48^{39}	29 11.5	117 59.6	0	18.4	2715	2581	2427	33.79h
526	2:40 p.m.	48^{40}	29 9.2	118 0.8	0	18.8	2716	2582	2417	33.80h
527	3:00 p.m.	49^{40}	29 6.9	118 2.9	0	19.0	2732	2597	2428	34.00h
528	3:20 p.m.	49^{40}	29 4.2	118 4.6	0	19.0	2733	2598	2429	34.01h
529	3:40 p.m.	49^{40}	29 2.1	118 5.8	0	19.0	2736	2601	2432	34.05h
530	4:00 p.m.	49^{40}	28 59.6	118 7.1	0	19.0	2735	2600	2431	34.04h
531	4:20 p.m.	50^{40}	28 56.8	118 10.0	0	19.0	2742	2607	2437	34.12h
532	4:40 p.m.	50^{40}	28 55.0	118 11.7	0	19.0	2707	2584	2404	33.69h
533	5:00 p.m.	51^{40}	28 52.7	118 13.3	0	19.4	.....	.....	.....	...
534	5:20 p.m.	51^{40}	28 51.0	118 14.6	0	19.2	2738	2603	2428	34.07h
535	5:40 p.m.	51^{40}	28 50.0	118 16.2	0	20.2	.....	.....	.....	...
				Aug. 29, 1908						
536	6:40 a.m.	52^{34}	29 8.3	117 17.9	0	18.8	2723	2588	2424	33.89h
537	7:00 a.m.	52^{34}	29 8.0	118 17.7	0	19.2	2740	2605	2431	34.10h

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0°/4°0	Specific gravity: 17°5/17°5	Specific gravity: t°/4°0	Salinity S ‰
				Aug. 29, 1908						
538	7:20 a.m.	51.5[34]	29° 7.6	118° 17.5	0	19.2	2730	2595	2421	33.97h
539	7:40 a.m.	51[35]	29 7.2	118 17.3	0	19.4	2734	2599	2420	34.02h
540	8:00 a.m.	51[35]	29 7.0	118 17.0	0	19.6	2722	2588	2403	33.87h
541	8:20 a.m.	51[35]	29 7.1	118 17.0	0	19.5	2746	2610	2429	34.17h
542	8:40 a.m.	51[35]	29 7.1	118 17.0	0	19.8	2731	2596	2406	33.99h
543	9:00 a.m.	51[35]	29 7.2	118 17.0	0	20.0	2709	2575	2380	33.71h
544	9:20 a.m.	51[35]	29 7.2	118 17.0	0	20.0	2729	2594	2398	33.96h
545	9:40 a.m.	51[35]	29 7.2	118 17.0	0	19.9	2737	2602	2410	34.06h
546	10:00 a.m.	51[35]	29 7.3	118 17.0	0	20.4	2743	2608	2403	34.13h
547	10:20 a.m.	51[35]	29 7.3	118 17.0	0	19.9	2715	2581	2388	33.79h
548	10:40 a.m.	51[35]	29 7.4	118 17.0	0	20.0	2727	2592	2397	33.94h
549	10:40 a.m.	51[35]	29 7.4	118 17.0	1540	.....	2793	2655	.....	34.76hK
550	11:00 a.m.	51[34.5]	29 7.5	118 17.0	0	20.2	2731	2596	2395	33.99h
551	11:20 a.m.	51[34.5]	29 7.5	118 17.0	0	20.2	2717	2583	2382	33.81h
552	11:40 a.m.	51[34]	29 7.6	118 17.0	0	20.2	2733	2598	2397	34.01h
553	11:45 a.m.	51[34]	29 7.6	118 16.9	1100	.....	2792	2654	.....	34.74hK
554	12:01 p.m.	51[34]	29 7.7	118 16.9	0	20.2	2726	2591	2391	33.92h
555	12:20 p.m.	51[34]	29 7.7	118 16.9	0	20.4	2710	2576	2370	33.73h
556	12:30 p.m.	51[34]	29 7.8	118 16.9	730	.....	2782	2550	.....	34.62hK
557	12:40 p.m.	51[34]	29 7.8	118 16.9	0	20.2	2731	2596	2396	33.99h
558	12:50 p.m.	51[34]	29 7.8	118 16.9	550	.....	2781	2643	.....	34.61hK
559	1:00 p.m.	51[34]	29 7.9	118 16.9	0	20.2	2720	2586	2385	33.85h
560	1:20 p.m.	51[34]	29 7.9	118 16.9	0	20.2	2706	2573	2372	33.68h
561	1:45 p.m.	51[34]	29 8.0	118 16.9	365	9.8	2780	2643	2669	34.60hK
562	1:45 p.m.	51[34]	29 8.0	118 16.9	0	20.4	2720	2586	2380	33.85h
563	1:58 p.m.	51[34]	29 8.1	118 16.9	275	10.5	2767	2641	2645	34.43bK
564	2:00 p.m.	51[34]	29 8.1	118 16.9	0	20.6	2724	2589	2379	33.90h
565	2:20 p.m.	51[34]	29 8.2	118 16.9	0	20.2	2741	2606	2407	34.11h
566	2:22 p.m.	51[34]	29 8.2	118 16.9	185	11.6	2769	2632	2627	34.46hK
567	2:40 p.m.	51[34]	29 8.3	118 16.9	0	20.2	2733	2598	2398	34.01h
568	2:40 p.m.	51[34]	29 8.3	118 16.9	137	12.3	2731	2596	2576	33.99hK
569	2:54 pm.	51[34]	29 8.4	118 16.9	92	14.3	2715	2581	2522	33.79hK
570	3:00 p.m.	51[34]	29 8.4	118 16.9	0	19.06	2710	2576	2406	33.73h
571	3:05 p.m.	51[34]	29 8.5	118 16.8	46	16.3	2719	2585	2481	33.84hK
572	3:20 p.m.	51[34]	29 8.5	118 16.8	0	20.8	2729	2594	2378	33.96h
573	3:21 p.m.	51[34]	29 8.5	118 16.8	1280	.....	2794	2656	.....	34.77hK
574	3:40 p.m.	51[34]	29 8.6	118 16.8	0	20.6	2718	2584	2373	33.83h
575	4:00 p.m.	51[34]	29 8.6	118 16.8	0	20.3	2708	2574	2371	33.70h
576	4:20 p.m.	51.5[34]	29 8.6	118 17.5	0	20.5	2724	2589	2380	33.90h
577	4:40 p.m.	52[34]	29 8.6	118 18.0	0	20.4	2717	2583	2377	33.81h
578	5:00 p.m.	52[34]	29 8.6	118 18.0	0	20.4	2715	2581	2376	33.79h
579	5:20 p.m.	52[34]	29 8.6	118 18.0	0	20.15	2706	2573	2374	33.68h
580	5:40 p.m.	52[34]	29 8.6	118 18.0	0	20.1	2728	2593	2395	33.95h
581	6:00 p.m.	52[34]	29 8.6	118 18.0	0	20.2	.....	.....	.....	.....
				Aug. 30, 1908						
582	7:00 a.m.	51.5[34]	29 7.6	118 17.5	0	20.2	2728	2593	2393	33.95h
583	8:00 a.m.	51[35]	29 7.0	117 17.0	0	20.4	2728	2593	2387	33.95h
584	9:00 a.m.	51[34]	29 7.8	118 16.9	0	19.1	2731	2596	2425	33.99h
585	10:00 a.m.	51[34]	29 8.6	118 16.8	0	19.1	2729	2594	2424	33.96h
586	11:00 a.m.	51.5[34]	29 8.6	118 17.5	0	19.3	2715	2581	2404	33.79h
587	12:01 p.m.	52[34]	29 8.6	118 18.0	0	19.6	2722	2588	2404	33.88h
588	1:00 p.m.	51[35]	29 6.9	118 16.2	0	18.6	2723	2588	2429	33.89h
589	1:20 p.m.	51[35]	29 6.8	118 13.8	0	18.7	2727	2592	2432	33.94h
590	1:40 p.m.	50[35]	29 5.3	118 12.0	0	19.0	2712	2578	2409	33.75h
591	2:00 p.m.	50[35]	29 4.6	118 8.4	0	19.0	2700	2567	2397	33.60h
592	2:20 p.m.	49[35]	29 3.7	118 6.6	0	19.1	2708	2574	2403	33.70h
593	2:40 p.m.	49[36]	29 2.4	118 4.6	0	19.1	2695	2562	2389	33.54h
594	3:00 p.m.	48[36]	29 1.6	118 2.3	0	19.2	2716	2582	2408	33.80h
595	3:20 p.m.	48[36]	29 0.4	118 0.8	0	19.2	2721	2587	2413	33.86h
596	3:40 p.m.	48[36]	28 59.4	117 59.3	0	19.2	2690	2557	2381	33.48h
597	4:00 p.m.	47[36]	28 58.6	117 56.8	0	19.1	2706	2513	2400	33.68h
598	4:20 p.m.	47[36]	28 58.4	117 54.8	0	19.0	2699	2566	2396	33.59h
599	4:40 p.m.	47[37]	28 57.0	117 52.6	0	18.8	2701	2568	2403	33.61h
600	5:00 p.m.	46[37]	28 56.8	117 50.0	0	18.4	2721	2587	2433	33.86h

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position		Depth in meters	Temperature in centigrade	Specific gravity			Salinity S ‰
			North latitude	West longitude			0° S / 4°0	17°5 S / 17°5	t° S / 4°0	
				Aug. 30, 1908						
601	5:20 p.m.	46[37]	28° 56'2	117° 48'2	0	18°2	2695	2562	2411	33.54h
602	5:40 p.m.	45[37]	28 55.8	117 45.6	0	18.4	2702	2569	2414	33.63h
603	6:00 p.m.	45[37]	28 54.2	117 43.2	0	18.2	2685	2552	2404	33.42h
604	6:20 p.m.	44[37]	28 52.9	117 40.3	0	18.2	2688	2555	2407	33.45h
605	6:40 p.m.	44[38]	28 52.3	117 38.3	0	18.3	2694	2561	2410	33.53h
606	7:00 p.m.	43[38]	28 51.6	117 35.7	0	18.2	2703	2570	2419	33.64h
607	7:20 p.m.	43[38]	28 50.2	117 33.5	0	18.4	2713	2579	2425	33.76h
608	7:40 p.m.	42[38]	28 49.6	117 29.3	0	18.4	2702	2569	2414	33.63h
609	8:00 p.m.	42[38]	28 48.5	117 27.6	0	18.2	2688	2555	2407	33.45h
610	8:20 p.m.	41[39]	28 47.0	117 25.4	0	18.8	2704	2571	2405	33.65h
611	8:40 p.m.	41[39]	28 46.4	117 23.3	0	19.2	2724	2589	2416	33.90h
612	9:00 p.m.	40[39]	28 45.7	117 20.5	0	19.5	2706	2573	2389	33.68h
613	9:20 p.m.	40[39]	28 44.8	117 18.4	0	19.6	2694	2561	2377	33.53h
614	9:40 p.m.	39[39]	28 44.1	117 15.8	0	19.6	2702	2569	2383	33.63h
615	10:00 p.m.	39[39]	28 43.1	117 13.1	0	19.6	2701	2568	2381	33.61h
616	10:20 p.m.	38[40]	28 42.2	117 10.1	0	19.5	2701	2568	2385	33.61h
617	10:40 p.m.	38[40]	28 41.2	117 8.1	0	19.6	2716	2582	2397	33.80h
618	11:00 p.m.	37[40]	28 40.5	117 6.4	0	19.6	2702	2569	2383	33.63h
619	11:20 p.m.	37[40]	28 39.6	117 3.9	0	19.6	2702	2569	2383	33.63h
620	11:40 p.m.	36[40]	28 38.7	117 1.9	0	19.4	2710	2576	2397	33.73h
				Aug. 31, 1908						
621	12:01 a.m.	36[40]	28 37.9	116 59.1	0	19.4	2709	2575	2396	33.71h
622	12:20 a.m.	35[41]	28 37.0	116 56.3	0	19.4	2702	2569	2389	33.63h
623	12:40 a.m.	35[41]	28 35.6	116 54.2	0	19.4	2717	2583	2404	33.81h
624	1:00 a.m.	34[41]	28 35.2	116 50.9	0	19.6	2699	2566	2380	33.59h
625	1:20 a.m.	34[41]	28 34.3	116 49.5	0	19.6	2712	2578	2393	33.75h
626	1:40 a.m.	33[41]	28 33.2	116 46.3	0	19.3	2700	2567	2389	33.60h
627	2:00 a.m.	33[41]	28 33.0	116 44.6	0	18.7	2681	2549	2388	33.37h
628	2:20 a.m.	32[41]	28 32.7	116 42.0	0	18.7	2692	2559	2399	33.50h
629	2:40 a.m.	32[42]	28 20.7	116 39.7	0	18.7	2713	2579	2418	33.76h
630	3:00 a.m.	31[42]	28 29.4	116 36.0	0	18.7	2687	2554	2394	33.44h
631	3:20 a.m.	31[42]	28 29.0	116 33.1	0	19.0	2691	2558	2387	33.49h
632	3:40 a.m.	30[42]	28 27.8	116 31.4	0	19.2	2710	2576	2402	33.73h
633	4:00 a.m.	30[43]	28 26.8	116 29.5	0	19.2	2707	2574	2398	33.69h
634	4:20 a.m.	30[43]	28 26.1	116 28.3	0	19.2	2717	2583	2409	33.81h
635	4:40 a.m.	29[43]	28 25.8	116 26.3	0	19.0	2701	2568	2398	33.61h
636	5:00 a.m.	29[43]	28 24.0	116 23.3	0	19.4	2702	2569	2389	33.63h
637	5:20 a.m.	28[43]	28 23.8	116 22.1	0	18.8	2689	2556	2393	33.47h
638	5:40 a.m.	28[43]	28 23.1	116 19.2	0	18.8	2719	2585	2420	33.84h
639	6:00 a.m.	27[43]	28 22.7	116 17.1	0	18.6	2711	2577	2418	33.74h
640	6:20 a.m.	27[44]	28 22.1	116 16.0	0	18.5	2713	2579	2423	33.76h
641	6:40 a.m.	26.5[44]	28 21.1	116 12.5	0	18.0	2697	2564	2419	33.57h
642	7:00 a.m.	26[44]	28 20.8	116 10.8	0	17.4	2684	2552	2423	33.40h
643	7:20 a.m.	26[44]	28 20.8	116 10.8	0	17.4	2684	2552	2423	33.40h
644	7:40 a.m.	26[44]	28 20.8	116 10.8	0	17.4	.....	.....	.....	.....
645	8:00 a.m.	26[44]	28 20.8	116 10.8	0	17.3	2713	2579	2451	33.76h
646	8:20 a.m.	26[44]	28 20.8	116 10.8	0	17.2	2681	2549	2424	33.37h
647	8:40 a.m.	26[44]	28 20.8	116 10.8	0	17.3	2697	2564	2439	33.57h
648	8:50 a.m.	26[44]	28 20.8	116 10.8	1430	.....	2743	2608	.....	34.14hK
649	9:00 a.m.	26[44]	28 20.8	116 10.8	0	17.4	2694	2561	2432	33.53h
650	9:20 a.m.	26[44]	28 20.8	116 10.8	0	17.6	2686	2553	2420	33.43h
651	9:40 a.m.	26[44]	28 20.8	116 10.8	0	17.5	2675	2543	2410	33.28h
652	9:48 a.m.	26[44]	28 20.8	116 10.8	1100	.....	2756	2620	.....	34.30hK
653	10:00 a.m.	26[44]	28 20.8	116 10.8	0	17.8	2677	2545	2405	33.31h
654	10:20 a.m.	26[44]	28 20.8	116 10.8	0	17.7	2707	2574	2436	33.69h
655	10:30 a.m.	26[44]	28 20.8	116 10.8	730	.....	2758	2622	.....	34.32hK
656	10:40 a.m.	26[44]	28 20.8	116 10.8	0	17.9	2687	2554	2413	33.44h
657	10:58 a.m.	26[44]	28 20.8	116 10.8	365	9.2	2759	2623	2659	34.33hK
658	11:00 a.m.	26[44]	28 20.8	116 10.8	0	18.0	2685	2552	2409	33.42h
659	11:18 a.m.	26[44]	28 20.8	116 10.8	185	.....	2743	2608	.....	34.14hK
660	11:20 a.m.	26[44]	28 20.8	116 10.8	0	17.5	2682	2550	2419	33.38h
661	11:30 a.m.	26[44]	28 20.8	116 10.8	137	11.7	2779	2642	2635	34.58hK
662	11:40 a.m.	26[44]	28 20.8	116 10.8	0	17.8	2700	2567	2427	33.60h
663	11:43 a.m.	26[44]	28 20.8	116 10.8	92	11.9	2755	2619	2607	34.29hK

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° S / 4°0	Specific gravity: 17°5 S / 17°5	Specific gravity: t° S / 4°0	Salinity S ‰
				Aug. 31, 1908						
664	11:54 a.m.	26[44]	28° 20.8	116° 10.8	46	13°3	2727	2592	2554	33.94hK
665	12:01 p.m.	26[44]	28 20.8	116 10.8	0	18.6	2726	2591	2433	33.93h
666	12:20 p.m.	26[44]	28 19.2	116 8.8	0	20.0	2728	2593	2398	33.95h
667	12:40 p.m.	25[44]	28 17.7	116 6.3	0	19.6	2717	2583	2398	33.81h
668	1:00 p.m.	25[45]	28 16.9	116 3.8	0	20.2	2693	2560	2361	33.52h
669	1:20 p.m.	24[45]	28 15.8	116 1.7	0	19.25	2725	2590	2415	33.91h
670	1:40 p.m.	24[45]	28 14.7	116 0.0	0	20.2	2695	2562	2361	33.54h
671	2:00 p.m.	23.5[46]	28 13.8	115 57.5	0	20.3	2729	2594	2391	33.96h
672	2:20 p.m.	23[45]	28 13.1	115 55.8	0	20.2	2731	2596	2397	33.99h
673	2:40 p.m.	23[46]	28 12.1	115 52.9	0	20.1	2719	2585	2387	33.84h
674	3:00 p.m.	22[46]	28 11.5	115 50.8	0	20.2	2720	2586	2385	33.85h
675	3:20 p.m.	21[46]	28 10.4	115 47.1	0	20.6	2711	2577	2366	33.74h
676	3:40 p.m.	21[46]	28 9.6	115 45.4	0	19.5	2728	2593	2411	33.95h
677	4:00 p.m.	21[46]	28 9.2	115 43.8	0	20.9	2722	2588	2368	33.88h
678	4:20 p.m.	20[46]	28 8.5	115 40.8	0	20.8	2718	2584	2368	33.83h
679	4:40 p.m.	20[47]	28 6.9	115 39.2	0	20.3	2716	2582	2379	33.80h
680	5:00 p.m.	19[47]	28 6.1	115 36.4	0	20.6	2726	2591	2380	33.93h
681	5:20 p.m.	19[47]	28 5.0	115 34.2	0	20.0	2734	2599	2403	34.03h
682	5:40 p.m.	18[47]	28 4.6	115 32.1	0	20.4	2714	2580	2375	33.78h
683	6:00 p.m.	18[47]	28 4.2	115 30.8	0	20.2	.....	.....	.....	.....
684	6:20 p.m.	17[47]	28 2.7	115 26.7	0	19.0	2734	2599	2430	34.03h
				Sept. 1, 1908						
685	5:40 a.m.	16[47]	28 5.1	115 20.0	0	19.4	2715	2581	2402	33.79h
686	6:00 a.m.	16[47]	28 3.7	115 18.6	0	19.6	2732	2597	2412	34.00h
687	6:20 a.m.	15[48]	28 2.1	115 17.3	0	18.95	.....	.....	.....	.....
688	6:40 a.m.	15[48]	28 0.6	115 16.0	0	18.4	2721	2587	2433	33.83h
689	7:00 a.m.	15[48]	27 59.1	115 14.5	0	19.5	2726	2591	2410	33.93h
690	7:20 a.m.	15[48.5]	27 57.5	115 13.2	0	19.4	2729	2594	2415	33.96h
691	7:40 a.m.	14[49]	27 56.2	115 12.1	0	19.4	2720	2586	2405	33.85h
692	8:00 a.m.	14[49]	27 56.0	115 11.0	0	18.8	2725	2590	2400	33.91h
693	8:20 a.m.	14[49]	27 55.3	115 10.0	0	20.1	2728	2593	2396	33.95h
694	8:40 a.m.	14[49]	27 54.6	115 8.9	0	20.7	2712	2578	2367	33.75h
695	9:00 a.m.	14[49]	27 54.2	115 8.0	0	20.8	.....	.....	.....	.....
696	9:20 a.m.	13.5[49]	27 55.8	115 7.5	0	20.6	.....	.....	.....	.....
697	9:40 a.m.	13[48]	27 57.6	115 7.1	0	20.4	.....	.....	.....	.....
698	10:00 a.m.	13[48]	27 58.9	115 6.6	0	20.6	2723	2588	2381	33.89h
699	10:20 a.m.	13[48]	28 0.6	115 6.3	0	20.7	2727	2592	2378	33.94h
700	10:40 a.m.	13[48]	28 2.1	115 6.0	0	20.5	2724	2589	2381	33.90h
701	11:00 a.m.	13[47]	28 4.3	115 5.8	0	21.0	2718	2584	2361	33.83h
702	11:20 a.m.	13[47]	28 6.6	115 5.8	0	21.2	2713	2579	2352	33.76h
703	11:40 a.m.	13[46]	28 8.9	115 5.6	0	21.4	2727	2592	2359	33.94h
704	12:01 p.m.	13[46]	28 11.2	115 5.5	0	20.8	2718	2584	2367	33.83h
705	12:20 p.m.	13[45]	28 13.3	115 5.3	0	21.8	2717	2583	2338	33.81h
706	12:40 p.m.	13[45]	28 15.3	115 6.7	0	21.9	2714	2580	2333	33.78h
707	1:00 p.m.	13[45]	28 17.3	115 7.3	0	21.4	2718	2584	2350	33.83h
708	1:20 p.m.	14[44]	28 19.4	115 9.5	0	19.4	2678	2546	2362	33.34h
709	1:40 p.m.	14[44]	28 21.4	115 10.9	0	20.6	2705	2572	2360	33.66h
710	2:00 p.m.	14[43.5]	28 22.5	115 12.2	0	20.4	2693	2560	2356	33.52h
				Sept. 2, 1908						
711	5:40 a.m.	14[43.5]	28 22.5	115 12.2	0	19.8	2716	2582	2392	33.80h
712	6:00 a.m.	14[43.5]	28 22.5	115 12.2	0	19.4	2669	2537	2353	33.21h
713	5:20 a.m.	14[43]	28 24.0	115 11.5	0	18.8	2715	2581	2417	33.79h
714	5:40 a.m.	14[43]	28 25.9	115 11.2	0	18.2	2720	2586	2436	33.85h
715	6:00 a.m.	14[42]	28 27.9	115 10.9	0	18.0	2691	2558	2414	33.49h
716	6:20 a.m.	14[42]	28 29.5	115 10.5	0	17.8	2713	2579	2440	33.76h
717	6:40 a.m.	14[42]	28 31.0	115 10.2	0	17.8	2711	2577	2438	33.74h
718	7:00 a.m.	14[41]	28 32.9	115 10.0	0	17.8	2703	2570	2430	33.64h
719	7:20 a.m.	14[41]	28 34.6	115 9.8	0	16.9	2698	2565	2448	33.58h
720	7:40 a.m.	14[41]	28 36.5	115 9.4	0	16.2	2709	2575	2473	33.71h
721	8:00 a.m.	14[40]	28 38.2	115 9.0	0	16.1	.....	.....	.....	.....
722	8:20 a.m.	14[40]	28 40.1	115 8.8	0	16.2	2700	2567	2464	33.60h
723	8:40 a.m.	14[40]	28 42.0	115 8.4	0	17.7	2717	2583	2445	33.81h
724	9:00 a.m.	14[39]	28 44.0	115 8.0	0	17.8	2707	2574	2433	33.69h
725	9:20 a.m.	14[39]	28 45.9	115 7.8	0	17.8	2713	2579	2440	33.76h

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: $S\frac{0°}{4°0}$	Specific gravity: $S\frac{17°5}{17°5}$	Specific gravity: $S\frac{t°}{4°0}$	Salinity S ‰
			Sept. 2, 1908							
726	9:40 a.m.	13^{38}	28° 48.0	115° 7.4	0	17°5	2720	2586	2454	33.85h
727	10:00 a.m.	13^{38}	28 50.0	115 7.1	0	17.0	2705	2572	2451	33.66h
728	10:20 a.m.	13^{38}	28 51.4	115 6.9	0	18.4	2716	2582	2429	33.80h
729	10:40 a.m.	13^{37}	28 53.9	115 6.5	0	18.3	2731	2596	2444	33.99h
730	11:00 a.m.	13^{37}	28 56.0	115 6.2	0	18.6	2712	2578	2419	33.75h
731	11:20 a.m.	13^{36}	28 58.0	115 5.9	0	18.7	.....	.....	.....	.....
732	11:40 a.m.	13^{36}	29 0.7	115 5.5	0	18.5	2723	2588	2433	33.89h
733	12:01 p.m.	13^{35}	29 3.2	115 5.0	0	19.0	2737	2602	2433	34.06h
734	12:20 p.m.	13^{35}	29 5.2	115 4.8	0	18.8	.....	.....	.....	.....
735	12:40 p.m.	13^{35}	29 7.2	115 4.4	0	18.5	.....	.....	.....	.....
736	1:00 p.m.	13^{34}	29 9.9	115 4.0	0	17.8	2727	2592	2454	33.94h
737	1:20 p.m.	13^{34}	29 12.0	115 3.8	0	18.2	2734	2599	2449	34.03h
738	1:40 p.m.	13^{33}	29 14.1	115 3.3	0	17.7	2730	2595	2459	33.98h
739	2:00 p.m.	13^{33}	29 16.4	115 2.8	0	17.6	2714	2580	2446	33.78h
740	2:20 p.m.	12.5^{32}	29 18.2	115 2.5	0	17.2	2710	2576	2452	33.73h
741	2:40 p.m.	12^{32}	29 19.9	115 2.3	0	17.0	2716	2582	2461	33.80h
742	3:00 p.m.	12^{32}	29 21.4	115 2.0	0	17.4	2693	2560	2431	33.52h
743	3:20 p.m.	$(12^{31.5})$	29 22.5	115 2.3	0	18.8	2708	2574	2411	33.70h
744	3:40 p.m.	(13^{31})	29 23.3	115 6.0	0	17.2	2729	2594	2470	33.96h
745	4:00 p.m.	(14^{31})	29 25.0	115 11.2	0	17.1	.....	.....	.....	.....
746	4:20 p.m.	(15^{31})	29 25.3	115 12.7	0	16.5	2713	2579	2471	33.76h
747	4:40 p.m.	(15^{31})	29 26.6	115 13.7	0	16.4	2733	2598	2493	34.01h
748	5:00 p.m.	(15^{30})	29 28.0	115 15.3	0	16.2	2731	2596	2494	33.99h
749	5:20 p.m.	(15^{30})	29 29.1	115 16.9	0	16.6	2732	2597	2486	34.00h
750	5:40 p.m.	16^{30}	29 30.1	115 18.5	0	17.2	2734	2599	2474	34.03h
751	6:00 p.m.	16^{30}	29 31.3	115 20.3	0	17.2	2706	2573	2447	33.68h
752	6:20 p.m.	(16.5^{29})	29 32.6	115 22.5	0	16.2	2715	2581	2478	33.79h
753	6:40 p.m.	(17^{29})	29 33.6	115 24.0	0	16.0	2727	2592	2495	33.94h
754	7:00 p.m.	(17^{29})	29 34.7	115 25.7	0	16.0	2713	2579	2483	33.76h
755	7:20 p.m.	(17^{28})	29 35.6	115 26.8	0	15.5	2704	2571	2485	33.65h
756	7:40 p.m.	(18^{29})	29 36.1	115 27.8	0	15.8	2709	2575	2484	33.71h
757	8:00 p.m.	(18^{28})	29 36.6	115 28.3	0	14.4	2694	2561	2498	33.53h
			Sept. 4, 1908							
758	4:20 a.m.	(18^{29})	29 36.5	115 31.3	0	14.8	2726	2591	2522	33.93h
759	4:40 a.m.	(19^{28})	29 38.5	115 34.0	0	15.0	.....	.....	.....	.....
760	5:00 a.m.	(19^{28})	29 40.0	115 36.3	0	13.4	2712	2578	2538	33.75h
761	5:20 a.m.	20^{28}	29 41.8	115 39.0	0	13.0	2716	2582	2548	33.80h
762	5:40 a.m.	(20^{27})	29 43.6	115 41.5	0	13.8	2719	2585	2536	33.84h
763	6:00 a.m.	$(21)^{27}$	29 45.0	115 43.7	0	14.0	2712	2578	2526	33.75h
764	6:20 a.m.	$(21)^{27}$	29 46.5	115 45.3	0	13.4	2705	2572	2530	33.66h
765	6:40 a.m.	(21^{26})	29 47.9	115 47.0	0	14.8	2708	2574	2504	33.70h
766	7:00 a.m.	(21^{26})	29 48.1	115 47.2	0	15.5	2728	2593	2507	33.95h
767	7:20 a.m.	(21^{26})	29 48.3	115 47.4	0	15.6	2700	2567	2480	33.60h
768	7:40 a.m.	22^{26}	29 49.3	115 47.6	0	15.4	2709	2575	2492	33.71h
769	8:00 a.m.	22^{26}	29 50.3	115 48.3	0	15.3	.....	.....	.....	.....
770	8:20 a.m.	22^{25}	29 52.8	115 49.3	0	15.5	2716	2582	2498	33.80h
771	8:40 a.m.	22^{25}	29 55.0	115 50.4	0	14.6	2702	2569	2502	33.63h
772	9:00 a.m.	22^{25}	29 56.8	115 51.3	0	14.1	2728	2593	2537	33.95h
773	9:20 a.m.	$(22)^{24}$	29 58.5	115 52.0	0	14.7	2705	2572	2503	33.66h
774	9:40 a.m.	23^{24}	30 0.3	115 52.7	0	15.2	2707	2574	2494	33.69h
775	10:00 a.m.	23^{24}	30 2.1	115 53.5	0	15.2	2707	2574	2494	33.69h
776	10:20 a.m.	23^{23}	30 3.7	115 54.4	0	15.6	2713	2579	2491	33.76h
777	10:40 a.m.	23^{23}	30 6.5	115 55.5	0	16.1	2717	2583	2484	33.81h
778	11:00 a.m.	23^{23}	30 7.4	115 55.8	0	16.8	2707	2574	2452	33.69h
779	11:20 a.m.	23^{22}	30 9.2	115 56.7	0	17.5	2712	2578	2447	33.75h
780	11:40 a.m.	23^{22}	30 11.4	115 57.7	0	16.6	2706	2573	2461	33.68h
781	12:01 p.m.	24^{21}	30 13.0	113 58.3	0	16.8	2711	2577	2461	33.74h
782	12:20 p.m.	24^{21}	30 15.0	115 59.3	0	17.4	.....	.....	.....	.....
783	12:40 p.m.	24^{21}	30 16.7	116 0.0	0	17.4	2678	2546	2416	33.33h
784	1:00 p.m.	(24^{20})	30 18.5	116 0.7	0	16.9	2722	2588	2471	33.88h
785	1:20 p.m.	(24^{20})	30 20.3	116 1.6	0	16.7	2715	2581	2469	33.79h
786	1:40 p.m.	(24^{20})	30 21.7	116 2.3	0	17.9	2680	2548	2407	33.35h
787	2:00 p.m.	$(25)^{19}$	30 23.2	116 3.0	0	16.0	2702	2569	2472	33.63h
788	2:20 p.m.	$(25)^{19}$	30 24.7	116 3.6	0	18.0	2697	2564	2419	33.57h

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° S 4°0	Specific gravity: 17°5 S 17°5	Specific gravity: 1° S 4°0	Salinity S ‰
				Sept. 4, 1908						
789	2:40 p.m.	(25)[19]	30° 26′2	116° 4′2	0	17°8	2721	2587	2448	33.86h
790	3:00 p.m.	(25)[18]	30 27.7	116 4.9	0	18.0	2703	2570	2425	33.64h
791	3:20 p.m.	(25)[18]	30 29.0	116 5.7	0	18.4	2728	2593	2439	33.95h
792	3:40 p.m.	(25)[18]	30 30.3	116 6.0	0	17.9	2713	2579	2437	33.76h
793	4:00 p.m.	(25)[18]	30 31.5	116 6.5	0	18.0	2673	2541	2397	33.27h
794	4:20 p.m.	(25)[18]	30 32.3	116 6.9	0	18.6	.....	.....	.....	.....
795	4:40 p.m.	26[17]	30 34.7	116 8.0	0	17.7	2698	2536	2426	33.58h
796	5:00 p.m.	26[17]	30 36.5	116 8.9	0	17.9	2694	2561	2418	33.53h
797	5:20 p.m.	26[16]	30 37.7	116 9.5	0	18.0	2700	2567	2423	33.60h
798	5:40 p.m.	26[16]	30 39.1	116 10.1	0	18.1	2680	2548	2402	32.35h
799	6:00 p.m.	26[16]	30 40.7	116 10.9	0	18.0	2722	2588	2443	33.89h
800	6:20 p.m.	26[16]	30 42.2	116 11.5	0	17.6	2691	2558	2425	33.49h
801	6:40 p.m.	26[15]	30 43.8	116 12.3	0	16.2	2701	2568	2466	33.61h
802	7:00 p.m.	27[15]	30 45.2	116 13.0	0	17.4	2685	2552	2424	33.42h
803	7:20 p.m.	27[15]	30 46.5	116 13.6	0	16.9	2715	2581	2464	33.79h
804	7:40 p.m.	27[14]	30 48.0	116 14.2	0	16.4	2681	2549	2444	33.37h
805	8:00 p.m.	27[14]	30 49.1	116 14.8	0	16.2	2691	2558	2457	33.49h
806	8:20 p.m.	27[14]	30 50.6	116 15.5	0	15.5	2710	2576	2491	33.73h
807	8:40 p.m.	27[14]	30 52.2	116 16.2	0	15.3	2707	2574	2493	33.69h
808	9:00 p.m.	(27[13])	30 53.6	116 17.0	0	15.3	2704	2571	2490	33.65h
809	9:20 p.m.	(27,5[13])	30 55.1	116 17.5	0	14.4	2707	2574	2512	33.69h
810	9:40 p.m.	28[13])	30 56.6	116 18.2	0	14.1	2697	2564	2508	33.57h
811	10:00 p.m.	28[13]	30 56.8	116 20.7	0	17.5	2728	2593	2461	33.95h
812	10:20 p.m.	(28,5[12])	30 58.9	116 22.5	0	17.6	2705	2572	2436	33.66h
813	10:40 p.m.	29[12]	31 0.3	116 23.5	0	17.7	2717	2583	2447	33.81h
814	11:00 p.m.	29[11]	31 2.3	116 24.7	0	17.0	2725	2590	2470	33.91h
815	11:20 p.m.	29[11]	31 3.6	116 25.2	0	17.0	2704	2571	2451	33.65h
816	11:40 p.m.	29[11]	31 4.8	116 25.9	0	17.0	2707	2574	2454	33.69h
817	11:59 p.m.	29[11]	31 6.5	116 26.7	0	17.0	2703	2570	2450	33.64h
				Sept. 5, 1908						
818	12:20 a.m.	30[10]	31 8.2	116 27.8	0	17.0	2710	2576	2457	33.73h
819	12:40 a.m.	30[10]	31 9.7	116 28.7	0	16.9	2709	2575	2458	33.71h
820	1:00 a.m.	30[10]	31 11.5	116 29.7	0	17.0	2700	2567	2447	33.60h
821	1:20 a.m.	30[9]	31 13.2	116 30.7	0	16.9	2725	2590	2474	33.91h
822	1:40 a.m.	30[9]	31 14.7	116 31.4	0	16.5	2698	2565	2456	33.58h
823	2:00 a.m.	30[9]	31 16.0	116 32.3	0	15.6	2702	2569	2480	33.63h
824	2:20 a.m.	31[8]	31 17.6	116 33.3	0	15.6	2722	2588	2501	33.88h
825	2:40 a.m.	31[8]	31 19.2	116 34.2	0	15.1	2699	2566	2489	33.59h
826	3:00 a.m.	31[8]	31 20.7	116 35.0	0	15.2	2706	2573	2494	33.68h
827	3:20 a.m.	31[8]	31 22.2	116 35.9	0	14.8	2685	2552	2483	33.42h
828	3:40 a.m.	31[7]	31 23.7	116 36.6	0	13.8	2711	2577	2528	33.74h
829	4:00 a.m.	32[7]	31 25.4	116 37.7	0	14.6	2700	2567	2500	33.60h
830	4:20 a.m.	32[7]	31 27.0	116 38.6	0	15.2	2715	2581	2502	33.79h
831	4:40 a.m.	(32[6])	31 28.5	116 39.5	0	15.4	2709	2575	2492	33.71h
832	5:00 a.m.	(32[6])	31 30.2	116 40.5	0	15.8	2693	2560	2468	33.52h
833	5:20 a.m.	(32[6])	31 31.6	116 41.2	0	15.5	2710	2576	2492	33.73h
834	5:40 a.m.	(32[5])	31 33.2	116 42.1	0	15.9	2685	2552	2458	33.42h
835	6:00 a.m.	33[5]	31 35.7	116 43.3	0	16.6	2701	2568	2456	33.61h
836	6:20 a.m.	33[4]	31 38.0	116 44.7	0	17.3	2695	2562	2435	33.54h
837	6:40 a.m.	33[4]	31 40.1	116 45.7	0	17.9	2704	2571	2428	33.65h
838	7:00 a.m.	33[4]	31 41.5	116 46.5	0	17.9	2720	2586	2445	33.85h
839	7:20 a.m.	34[3]	31 44.1	116 48.0	0	17.8	2708	2574	2436	33.70h
840	7:40 a.m.	34[3]	31 46.1	116 49.0	0	17.7	2698	2565	2427	33.58h
841	8:00 a.m.	34[3]	31 47.7	116 49.7	0	17.4	2682	2550	2421	33.38h
842	8:20 a.m.	34[2]	31 50.1	116 51.0	0	17.2	2720	2586	2461	33.85h
843	8:40 a.m.	34[2]	31 50.7	116 51.3	0	17.0	2681	2549	2430	33.37h
844	9:00 a.m.	34[2]	31 52.2	116 52.1	0	16.8	2694	2561	2445	33.53h
845	9:30 a.m.	35[1]	31 53.8	116 53.0	0	16.7	2687	2554	2442	33.44h
846	9:40 a.m.	35[1]	31 55.6	116 53.8	0	17.4	.....	.....	.....	.....
847	10:00 a.m.	(35_6)	31 57.8	116 55.0	0	18.1	2675	2543	2397	33.28h
848	10:20 a.m.	(35_5)	32 0.0	116 56.1	0	18.2	2698	2565	2415	33.58h
849	10:40 a.m.	(35_4)	32 1.8	116 57.1	0	17.8	2722	2588	2448	33.88h
850	11:00 a.m.	36_3	32 3.2	116 57.7	0	18.4	2710	2576	2422	33.73h
851	11:20 a.m.	36_1	32 4.6	116 58.5	0	18.6	2721	2587	2427	33.86h

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position		Depth in meters	Temperature in centigrade	Specific gravity			Salinity S ‰
			North latitude	West longitude			$S^{0°}_{4°0}$	$S^{17°5}_{17°5}$	$S^{t°}_{4°0}$	
				Sept. 5, 1908						
852	11:40 a.m.	36_1	32° 6'4	116° 59'2	0	18°6	2707	2574	2414	33.69h
853	12:01 p.m.	$(36_{1.5})$	32 7.5	117 0.1	0	18.8	2717	2583	2418	33.81h
854	12:20 p.m.	(36_2)	32 8.5	117 0.5	0	18.6	2688	2559	2397	33.45h
855	12:40 p.m.	(36_2)	32 10.5	117 1.6	0	18.2	2715	2581	2432	33.79h
856	1:00 p.m.	(36.5_2)	32 12.2	117 2.5	0	16.4	2708	2574	2468	33.70h
857	1:20 p.m.	37_2	32 13.5	117 3.0	0	16.4	2712	2578	2473	33.75h
858	1:40 p.m.	37_2	32 15.0	117 3.7	0	18.0	2697	2564	2419	33.57h
859	2:00 p.m.	37_2	32 17.2	117 5.0	0	16.8	2703	2570	2454	33.64h
860	2:20 p.m.	(37_4)	32 19.8	117 6.0	0	16.0	2695	2562	2464	33.54h
861	2:40 p.m.	(37_4)	32 22.2	117 7.0	0	15.7	2707	2574	2483	33.69h
862	3:00 p.m.	38_2	32 24.2	117 8.0	0	16.0	2693	2560	2463	33.52h
863	3:20 p.m.	38_2	32 26.5	117 8.7	0	17.4	2699	2566	2435	33.59h
864	3:40 p.m.	$(38)_6$	32 28.7	117 9.7	0	19.0	2689	2556	2387	33.47h
865	4:00 p.m.	$(38)_6$	32 31.0	117 10.5	0	19.6	2706	2573	2386	33.68h
866	4:20 p.m.	(38_7)	32 33.3	117 11.5	0	19.0	2696	2563	2393	33.55h
				Feb. 19, 1909						
867	1:00 a.m.	(39_1)	32 38.0	117 14.0	0	13.5	2678	2546	2502	33.33
868	1:20 a.m.	39_1	32 37.3	117 15.3	0	13.2	.....	.....	.....	.....
869	1:40 a.m.	(39_4)	32 38.0	117 17.4	0	13.5	2679	2547	2503	33.34
870	2:00 a.m.	40_8	32 38.2	117 20.6	0	13.4	2674	2542	2500	33.27
871	2:20 a.m.	41_4	32 38.8	117 23.5	0	13.4	.....	.....	.....	.....
872	2:40 a.m.	41_8	32 39.2	117 25.6	0	13.5	2666	2534	2491	33.17
873	3:00 a.m.	42_8	32 39.6	117 28.4	0	13.5	2669	2537	2493	33.21
874	3:20 a.m.	42_8	32 40.3	117 30.8	0	13.4	.....	.....	.....	.....
875	3:40 a.m.	43_8	32 40.7	117 33.2	0	13.4	2688	2555	2515	33.45
876	4:00 a.m.	43_8	32 41.0	117 35.6	0	13.5	2688	2555	2513	33.45
877	4:20 a.m.	43_8	32 41.2	117 36.9	0	13.4	2693	2560	2519	33.52
878	4:40 a.m.	43_8	32 41.3	117 37.2	0	13.4	2706	2573	2531	33.68
879	5:00 a.m.	44_8	32 41.3	117 38.1	0	13.6	2697	2564	2518	33.57
880	5:20 a.m.	44_8	32 41.4	117 38.8	0	13.5	2701	2568	2523	33.61
881	5:40 a.m.	44_8	32 41.5	117 39.3	0	13.6	.....	.....	.....	.....
882	6:00 a.m.	44_8	32 41.5	117 39.7	0	13.6	2694	2561	2515	33.53
883	6:20 a.m.	44_8	32 41.5	117 39.7	0	13.6	2690	2557	2512	33.48
884	6:40 a.m.	44_8	32 41.5	117 39.7	0	13.5	2695	2562	2518	33.54h
885	7:05 a.m.	44_8	32 41.5	117 39.7	0	13.5	2693	2560	2516	33.52h
886	7:20 a.m.	44_8	32 41.5	117 39.7	0	13.5	.....	.....	.....	.....
887	7:40 a.m.	44_8	32 41.5	117 39.7	0	13.5	2691	2558	2514	33.49h
888	8:15 a.m.	44_8	32 41.5	117 39.7	0	13.6	.....	.....	.....	.....
889	8:40 a.m.	44_8	32 41.5	117 39.7	0	13.6	2686	2553	2509	33.43h
890	9:00 a.m.	44_8	32 41.5	117 39.7	0	13.6	2680	2548	2503	33.35h
891	9:05 a.m.	44_8	32 41.5	117 39.7	185	9.1	2748	2612	2650	34.20hK
892	9:10 a.m.	44_8	32 41.5	117 39.7	92	10.4	2739	2604	2619	34.09hK
893	9:20 a.m.	44_8	32 41.5	117 39.7	0	13.7	.....	.....		.....
894	9:27 a.m.	44_8	32 41.5	117 39.7	46	12.1	.....	.....	.....	..... K
895	9:40 a.m.	44_8	32 41.6	117 40.6	0	13.7	.....	.....	.....	
896	10:00 a.m.	44.5_8	32 42.0	117 42.5	0	13.7	.....	.....	.....	.....
897	10:20 a.m.	45_8	32 42.2	117 44.2	0	13.8	.....	.....	.....	.....
898	10:40 a.m.	45_9	32 42.6	117 45.8	0	13.9	.....	.....	.....	.....
899	11:00 a.m.	46_9	32 42.9	117 47.8	0	14.1	.....	.....	.....	.....
900	11:20 a.m.	46_9	32 43.2	117 49.6	0	14.2	.....	.....	.....	
901	11:40 a.m.	46.5_9	32 43.6	117 52.5	0	14.2	2686	2553	2496	33.43h
902	12:01 p.m.	47_9	32 43.9	117 53.6	0	14.6	2696	2563	2497	33.55
903	12:20 p.m.	47_9	32 44.2	117 55.2	0	14.3	2684	2552	2492	33.40h
904	12:40 p.m.	47_9	32 44.5	117 56.8	0	14.3	2693	2560	2502	33.52h
905	1:00 p.m.	48_9	32 44.9	117 59.0	0	14.2	2687	2554	2498	33.44h
906	1:20 p.m.	48_9	32 45.2	118 0.8	0	14.3	2698	2565	2505	33.58h
907	1:40 p.m.	48.5_9	32 45.5	118 2.5	0	14.4	2688	2555	2493	33.45h
908	2:00 p.m.	49_9	32 45.9	118 4.6	0	14.3	2695	2562	2503	33.54
909	2:20 p.m.	49_9	32 46.2	118 6.9	0	14.1	.....	.....	.....	.....
910	2:40 p.m.	50_9	32 46.5	118 9.7	0	14.1	2700	2567	2512	33.60h
911	3:00 p.m.	50_9	32 46.8	118 10.3	0	14.1	2688	2555	2500	33.45h
912	3:20 p.m.	50_9	32 47.2	118 12.1	0	13.7	2701	2568	2520	33.61h
913	3:40 p.m.	51_9	32 47.4	118 14.8	0	13.9	2682	2550	2498	33.38h
914	4:20 p.m.	51_{10}	32 47.8	118 16.0	0	13.7	2695	2562	2514	33.54h

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: S 0°/4°0	Specific gravity: S 17°5/17°5	Specific gravity: S t°/4°0	Salinity S ‰
				Feb. 19, 1909						
915	4:40 p.m.	52_{10}	32° 48'2	118° 18'0	0	13°6	2680	2548	2503	33.35h
916	5:00 p.m.	52_{10}	32 48.4	118 19.3	0	13.6	2693	2560	2515	33.52h
917	5:20 p.m.	52_{10}	32 48.7	118 21.1	0	13.4	2684	2552	2511	33.40h
918	5:40 p.m.	53_{10}	32 49.0	118 23.1	0	13.4	2683	2551	2510	33.39h
919	7:00 p.m.	53_{10}	32 49.0	118 23.1	0	13.4	2686	2553	2513	33.43h
920	8:00 p.m.	53_{10}	32 49.0	118 23.1	0	13.4	2684	2551	2510	33.40h
921	9:00 p.m.	53_{10}	32 49.0	118 23.1	0	13.4	2680	2548	2507	33.35h
922	10:00 p.m.	53_{10}	32 49.0	118 23.1	0	13.1	2690	2557	2521	33.48h
923	11:00 p.m.	53_{10}	32 49.0	118 23.1	0	13.0	2697	2564	2531	33.57
924	11:59 p.m.	53_{10}	32 49.0	118 23.1	0	13.0	2686	2553	2520	33.43
				Feb. 20, 1909						
925	12:50 a.m.	53_{10}	32 49.0	118 23.1	0	12.8	.....	.....	.....	.....
926	2:00 a.m.	53_{10}	32 49.0	118 23.1	0	13.0	2690	2557	2524	33.48
927	3:00 a.m.	53_{10}	32 49.0	118 23.1	0	13.0	2700	2567	2533	33.60h
928	4:00 a.m.	53_{10}	32 49.0	118 23.1	0	13.0	.....	.....	.....	.....
929	5:00 a.m.	53_{10}	32 49.0	118 23.1	0	13.0	.....	.....	.....	.....
930	6:00 a.m.	53_{10}	32 49.0	118 23.1	0	12.0	2693	2560	2545	33.52
931	7:00 a.m.	53_{10}	32 49.0	118 23.1	0	13.0	.....	.....	.....	.....
932	8:00 a.m.	52_{10}	32 48.6	118 20.2	0	13.6	.....	.....	.....	.....
933	8:20 a.m.	52_{10}	32 48.5	118 19.5	0	13.4	2680	2548	2506	33.35
934	8:40 a.m.	51_{10}	32 48.3	118 17.4	0	13.4	2688	2555	2514	33.45h
935	9:00 a.m.	51_{10}	32 48.0	118 15.1	0	13.4	2692	2559	2519	33.50h
936	9:20 a.m.	50_{11}	32 47.6	118 12.4	0	13.5	2690	2557	2515	33.48h
937	9:40 a.m.	50_9	32 47.3	118 9.7	0	13.5	2698	2565	2521	33.58h
938	10:00 a.m.	49_9	32 46.8	118 6.4	0	13.6	2687	2554	2509	33.44h
939	10:20 a.m.	49_9	32 46.4	118 3.8	0	13.6	2694	2561	2515	33.53h
940	10:40 a.m.	48_9	32 46.1	118 1.5	0	13.7	2684	2552	2504	33.40h
941	11:00 a.m.	48_9	32 45.6	117 58.6	0	14.0	2696	2563	2510	33.55h
942	11:20 a.m.	47_9	32 45.2	117 55.0	0	14.0	2685	2552	2498	33.42
943	11:40 a.m.	47_9	32 44.9	117 53.1	0	14.1	.....	.....	.....	.....
944	12:01 p.m.	46_9	32 44.5	117 50.0	0	13.8	2688	2555	2506	33.45h
945	12:20 p.m.	45_9	32 44.1	117 47.3	0	13.6	2692	2559	2513	33.50h
946	12:40 p.m.	45_9	32 43.8	117 44.5	0	13.7	2686	2553	2505	33.43h
947	1:00 p.m.	44_9	32 43.3	117 41.5	0	13.6	.....	.....	.....	.....
948	1:20 p.m.	44_9	32 42.9	117 38.3	0	13.7	2681	2549	2502	33.37
949	1:40 p.m.	$43_{8.5}$	32 42.5	117 35.1	0	13.6	2688	2555	2511	33.45h
950	2:00 p.m.	43_8	32 42.2	117 32.8	0	13.6	2692	2559	2515	33.50h
951	2:20 p.m.	42_8	32 41.7	117 29.3	0	13.6	2689	2556	2511	33.47h
952	2:40 p.m.	41_8	32 41.3	117 26.1	0	13.8	2692	2559	2510	33.50h
953	3:00 p.m.	41_8	32 41.0	117 23.9	0	13.8	2673	2541	2491	33.26
954	3:20 p.m.	40_8	32 40.8	117 22.3	0	13.8	2664	2532	2483	33.15h
955	3:40 p.m.	40_8	32 40.6	117 20.6	0	13.6	2677	2545	2499	33.28
956	4:00 p.m.	40_8	32 40.2	117 17.8	0	13.8	2692	2559	2510	33.50
957	4:20 p.m.	(39.)	32 38.8	117 16.5	0	13.4	2665	2532	2492	33.16h
958	4:40 p.m.	(39.)	32 39.4	117 14.2	0	13.8	2672	2540	2491	33.26h
959	5:00 p.m.	B	32 42.0	117 14.0	0	14.2	2667	2535	2479	33.24h
960	7:00 p.m.	B	32 43.0	117 13.5	0	14.2	2697	2564	2506	33.57
961	8:00 p.m.	B	32 43.0	117 13.5	0	14.0	2694	2561	2508	33.53
				June 8, 1909						
962	10:00 a.m.	$(40)_{10}$	32 51.7	117 18.0	0	18.2	2727	2592	2444	33.94
963	5:00 p.m.	$(40)_{10}$	32 51.7	117 18.0	0	18.4	2709	2575	2421	33.71
				June 9, 1909						
964	9:45 a.m.	$(40)_{10}$	32 51.7	117 18.0	0	18.6	2712	2578	2418	33.75
965	10:45 a.m.	$(40)_{10}$	32 51.7	117 18.0	0	18.6	2720	2586	2426	33.85
				June 10, 1909						
966	5:00 p.m.	$(40)_{10}$	32 51.7	117 18.0	0	18.8	2706	2573	2408	33.68
				June 11, 1909						
967	10:00 a.m.	$(40)_{10}$	32 51.7	117 18.0	0	18.8	2713	2579	2415	33.76
				June 14, 1909						
968	11:00 a.m.	$(40)_{10}$	32 51.7	117 18.0	0	18.9	2712	2578	2412	33.75
				June 15, 1909						
969	7:24 a.m.	39_8	32 39.4	117 13.8	0	17.0	2719	2585	2464	33.84
970	8:15 a.m.	39_7	32 37.1	117 14.5	0	17.0	2714	2580	2460	33.78
971	9:15 a.m.	40_8	32 42.0	117 19.8	0	17.1	2717	2583	2461	33.81
972	9:35 a.m.	40_9	32 43.8	117 22.1	0	17.8	2715	2581	2442	33.79
973	10:15 a.m.	41_9	32 47.4	117 26.2	0	18.3	2715	2581	2430	33.79

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: $S\frac{0°}{4°0}$	Specific gravity: $S\frac{17°5}{17°5}$	Specific gravity: $S\frac{t°}{4°0}$	Salinity S ‰
			June 15, 1909							
974	10:35 a.m.	42_{10}	32° 49?2	117° 28?8	0	18?3	2717	2583	2431	33.81
975	10:55 a.m.	42_{10}	32 50.8	117 30.8	0	18.3	2713	2579	2427	33.76
976	11:15 a.m.	42.5_{10}	32 52.2	117 32.5	0	18.5	2708	2575	2418	33.70
977	12:40 p.m.	42_{10}	32 51.5	117 30.6	365	.....	2740	2605	.....	34.10K
978	1:10 p.m.	42_{10}	32 51.0	117 29.2	185	.....	2737	2602	.....	34.06K
979	1:15 p.m.	42_{10}	32 51.2	117 28.8	92	.....	2714	2580	.....	33.78K
980	1:30 p.m.	42_{10}	32 51.5	117 28.4	0	18.2	2713	2579	2429	33.76
			June 16, 1909							
981	3:36 p.m.	42_{10}	32 52.1	117 32.1	730	.....	2760	2624	.....	34.35K
982	4:00 p.m.	42_{10}	32 51.9	117 32.3	0	19.4	2708	2574	2395	33.70
983	4:05 p.m.	42_{10}	32 51.9	117 31.5	550	.....	2759	2623	.....	34.34K
984	6:10 p.m.	42_{10}	32 51.7	117 32.4	0	19.0	2708	2574	2405	33.70
985	7:30 p.m.	42_{10}	32 50.9	117 31.8	0	18.8	2711	2577	2412	33.74
			June 19, 1909							
986	5:40 p.m.	39_{7}	32 37.1	117 14.5	0	17.4	2737	2602	2473	34.06
			June 21, 1909							
987	5:36 p.m.	42_{11}	32 52.8	117 32.2	0	18.5	2708	2574	2419	33.70
988	5:36 p.m.	42_{11}	32 52.8	117 32.2	460	.....	2764	2628	.....	34.40K
989	6:00 p.m.	42_{10}	32 52.0	117 31.3	365	.....	2745	2610	.....	34.16K
990	6:15 p.m.	42_{10}	32 51.8	117 30.5	275	.....	2751	2615	.....	34.24K
991	6:36 p.m.	42_{10}	32 51.8	117 29.9	185	9.1	2755	2619	2656	34.29K
992	6:45 p.m.	42_{10}	32 51.7	117 29.7	0	18.4	2706	2573	2417	33.68
993	6:45 p.m.	42_{10}	32 51.7	117 29.7	92	10.5	.....	.....	.....	.....K
994	8:20 p.m.	43_{10}	32 52.1	117 33.1	0	16.3	2705	2572	2467	33.66
			June 22, 1909							
995	4:40 a.m.	43_{11}	32 53.2	117 36.5	0	18.3	2706	2573	2421	33.68
996	6:20 a.m.	43_{11}	32 52.8	117 35.7	0	17.9	2704	2571	2428	33.65
			June 23, 1909							
997	4:45 a.m.	42_{10}	32 52	117 30	0	17.5	2705	2572	2439	33.66
998	6:00 a.m.	42_{10}	32 52	117 30	185	9.6	2733	2598	2627	34.01K
999	6:00 a.m.	42_{10}	32 52	117 30	0	17.6	2704	2571	2436	33.65
1000	8:00 a.m.	42_{10}	32 52	117 30	0	17.6	2701	2568	2433	33.61
			June 24, 1909							
1001	3:45 p.m.	42_{10}	32 52	117 30	0	18.4	2705	2572	2417	33.66
1002	3:55 p.m.	42_{10}	32 52	117 30	640	.....	2750	2614	.....	34.22K?
1003	4:50 p.m.	42_{10}	32 52	117 30	460	.....	2764	2628	.....	34.40K
1004	5:15 p.m.	42_{10}	32 52	117 30	0	17.9	2705	2572	2430	33.66
1005	5:50 p.m.	42_{10}	32 52	117 30	365	.....	2765	2629	.....	34.41K
1006	6:05 p.m.	42_{10}	32 52	117 30	275	.....	2760	2624	.....	34.35K
1007	6:30 p.m.	42_{10}	32 52	117 30	0	17.9	2705	2572	2430	33.66
1008	7:10 p.m.	42_{10}	32 52	117 30	0	17.6	2710	2576	2442	33.73
1009	8:25 p.m.	42_{10}	32 52	117 30	0	17.5	2707	2574	2441	33.69
			June 25, 1909							
1010	3:47 p.m.	42_{10}	32 52	117 30	460	.....	2764	2628	.....	34.40K
1011	3:55 p.m.	42_{10}	32 52	117 30	0	17.95	2711	2577	2434	33.74
1012	4:07 p.m.	42_{10}	32 52	117 30	365	.....	2763	2627	.....	34.39K
1013	4:25 p.m.	42_{10}	32 52	117 30	275	8.1	2764	2628	2680	34.40K
1014	4:44 p.m.	42_{10}	32 52	117 30	460	.....	2763	2627	.....	34.39K
1015	6:15 p.m.	42_{10}	32 52	117 30	0	17.7	2704	2571	2432	33.65
1016	7:00 p.m.	42_{10}	32 52	117 30	0	17.7	2720	2586	2449	33.85?
1017	7:45 p.m.	42_{10}	32 52	117 30	0	17.7	2704	2571	2432	33.65
1018	8:45 p.m.	42_{10}	32 52	117 30	0	17.6	2702	2569	2435	33.63
			June 28, 1909							
1019	4:30 p.m.	42_{10}	32 52	117 30	0	19.2	2707	2574	2400	33.69
1020	4:43 p.m.	42_{10}	32 52	117 30	730	.....	2767	2631	.....	34.44K
1021	6:00 p.m.	42_{10}	32 52	117 50	365	.....	2758	2622	.....	34.32K
1022	6:25 p.m.	42_{10}	32 52	117 30	0	19.2	2710	2576	2402	33.73
1023	7:13 p.m.	42_{10}	32 52	117 30	0	19.0	2707	2574	2404	33.69
1024	8:55 p.m.	42_{10}	32 52	117 30	0	19.0	2708	2575	2405	33.70
			June 29, 1909							
1025	5:32 a.m.	42_{10}	32 52	117 30	0	18.6	2706	2573	2413	33.68
1026	6:35 a.m.	42_{10}	32 52	117 30	0	18.7	2717	2583	2421	33.81
1027	11:00 a.m.	$(40)_{10}$	32 51.7	117 18.0	0	19.7	2711	2577	2390	33.74
			June 30, 1909							
1028	10:35 a.m.	$(40)_{10}$	32 51.5	117 19.1	0	19.6	.....	.....	.....	.....
1029	11:00 a.m.	$(40)_{10}$	32 51.5	117 22.3	0	19.8	2712	2578	2388	33.75

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: $S^{0°}_{4°}$	Specific gravity: $S^{17.5°}_{17.5°}$	Specific gravity: $t^{°}_{4°}$	Salinity S ‰
				June 30, 1909						
1030	11:20 a.m.	41_{10}	32° 51.3	117° 24.8	0	19.8	.....	.....	.....	.....
1031	11:40 a.m.	41_{10}	32 51.2	117 27.4	0	19.6	2713	2579	2394	33.76
1032	12:01 p.m.	42_{10}	32 51.2	117 29.9	0	19.6	2713	2579	2394	33.76
1033	12:20 p.m.	42_{10}	32 51.1	117 32.4	0	19.6	2718	2584	2400	33.83
1034	12:40 p.m.	43_{10}	32 51.0	117 35.0	0	19.3	2707	2574	2397	33.69
1035	1:00 p.m.	43_{10}	32 50.9	117 37.4	0	19.4	2710	2576	2397	33.73
1036	1:20 p.m.	44_{10}	32 50.8	117 40.0	0	19.2	2710	2576	2402	33.73
1037	1:40 p.m.	45_{10}	32 50.7	117 42.7	0	19.05	2717	2583	2413	33.81
1038	2:00 p.m.	45_{10}	32 50.5	117 45.5	0	18.7	2711	2577	2415	33.74
1039	2:20 p.m.	46_{10}	32 50.4	117 48.1	0	18.8	2711	2577	2413	33.74
1040	2:40 p.m.	46_{10}	32 50.4	117 50.8	0	19.15	2711	2577	2405	33.74
1041	3:00 p.m.	47_{10}	32 50.3	117 53.4	0	19.0	2717	2583	2414	33.81
1042	3:20 p.m.	47_{10}	32 50.2	117 56.2	0	18.75	2710	2576	2413	33.73
1043	3:40 p.m.	48_{10}	32 50.1	117 59.0	0	18.8	2718	2584	2420	33.83
1044	3:55 p.m.	48_{10}	32 50.1	118 1.7	0	19.05	2709	2575	2404	33.71
1045	4:30 p.m.	49_{10}	32 50.1	118 3.1	0	18.9	2718	2584	2418	33.83
1046	4:50 p.m.	49_{10}	32 49.8	118 5.4	0	18.9	2716	2582	2415	33.80
1047	5:10 p.m.	50_{10}	32 49.6	118 7.6	0	18.7	2713	2579	2418	33.76
1048	5:50 p.m.	50_{10}	32 49.5	118 9.7	0	18.3	.....	.....	.....	.....
1049	6:10 p.m.	50_{10}	32 49.4	118 11.9	0	18.3	2718	2584	2432	33.83
1050	6:30 p.m.	51_{10}	32 49.3	118 14.1	0	18.5	2711	2577	2421	33.74
1051	6:50 p.m.	51_{10}	32 49.2	118 16.3	0	18.8	2710	2576	2411	33.73
1052	7:15 p.m.	52_{10}	32 49.2	118 18.5	0	18.7	2715	2581	2420	33.79
1053	7:35 p.m.	52_{10}	32 48.8	118 20.3	0	18.8	2722	2588	2423	33.88
1054	8:00 p.m.	53_{10}	32 49.1	118 23.0	0	17.6	2717	2583	2450	33.81
				July 1, 1909						
1055	6:00 a.m.	53_{10}	32 49.1	118 23.0	0	17.5	2721	2587	2455	33.86
1056	6:50 a.m.	53_{10}	32 47.8	118 23.3	0	17.2	2712	2578	2453	33.75
1057	7:04 a.m.	53_{10}	32 47.6	118 25.0	0	16.5	2711	2577	2469	33.74
1058	7:25 a.m.	53_{10}	32 47.8	118 26.2	0	16.7	2713	2579	2466	33.76
1059	7:45 a.m.	53_{10}	32 47.7	118 26.3	0	16.7	2708	2574	2461	33.70
1060	8:00 a.m.	53_{10}	32 48.1	118 25.7	0	16.9	2720	2586	2469	33.85
1061	8:55 a.m.	$52_{9.5}$	32 47.5	118 21.8	0	17.4	2712	2578	2448	33.75
1062	10:05 a.m.	$52_{10.5}$	32 52.5	118 21.5	0	19.2	2715	2581	2407	33.79
1063	10:56 a.m.	52_{10}	32 52.0	118 21.5	825	....	2778	2641	.....	34.57K
1064	11:27 a.m.	52_{10}	32 52.0	118 21.5	640	....	2768	2631	.....	34.45K
1065	12:12 p.m.	52_{10}	32 52.0	118 21.5	275	7.1	2762	2626	2694	34.37K
1066	12:30 p.m.	52_{10}	32 52.0	118 21.5	365	.....	2760	2624	.....	34.35K
1067	1:05 p.m.	53_{11}	32 54.0	118 26.0	0	20.4	2719	2585	2380	33.84
				July 2, 1909						
1068	4:51 a.m.	52_{10}	32 48.6	118 20.4	0	18.65	2710	2576	2416	33.73
1069	5:11 a.m.	52_{10}	From 4:50 to 7:15 a.m.		0	18.7	2718	2584	2422	33.83
1070	5:40 a.m.	52_{10}	the boat drifted from		0	17.65	2719	2585	2451	33.84
1071	5:57 a.m.	52_{10}	the above position to		0	16.7	2717	2583	2470	33.81
1072	6:20 a.m.	52_{10}	the following position		0	16.6	2722	2588	2478	33.88
1073	7:00 a.m.	51.5_{10}	32 48.0	118 17.5	0	16.6	2714	2580	2470	33.78
1074	7:20 a.m.	51_{10}	32 47.2	118 16.9	0	16.8	2720	2586	2470	33.85
1075	7:40 a.m.	51_9	32 47.4	118 13.5	0	17.0	2714	2580	2460	33.78
1076	8:00 a.m.	50_9	32 47.0	118 10.2	0	16.6	2704	2571	2459	33.65
1077	8:20 a.m.	49_9	32 46.5	118 6.9	0	17.2	2710	2576	2452	33.73
1078	8:40 a.m.	49_9	32 46.0	118 3.5	0	17.3	2715	2581	2454	33.79
1079	9:00 a.m.	48_9	32 45.5	118 0.2	0	17.4	2698	2565	2434	33.58
1080	9:20 a.m.	47_9	32 45.0	117 56.8	0	17.6	2702	2569	2434	33.63
1081	9:40 a.m.	47_9	32 44.5	117 53.5	0	17.5	2700	2567	2434	33.60
1082	10:10 a.m.	46_9	32 44.5	117 50.0	0	17.7	2705	2572	2434	33.66
1083	10:43 a.m.	45_9	32 43.5	117 46.9	0	18.5	2708	2574	2418	33.70
1084	11:00 a.m.	45_9	32 43.0	117 43.4	0	18.65	2712	2578	2418	33.75
1085	11:20 a.m.	$44_{9.5}$	32 42.5	117 40.2	0	19.3	2706	2573	2394	33.68
1086	11:40 a.m.	43_9	32 42.0	117 36.8	0	19.8	2715	2581	2391	33.79
1087	12:01 p.m.	43_9	32 41.6	117 34.2	0	20.2	2716	2582	2383	33.80
1088	12:40 p.m.	42_9	32 41.2	117 32.3	0	20.6	2715	2581	2370	33.79
1089	1:40 p.m.	42_9	32 41.2	117 32.3	0	20.5	2722	2588	2378	33.88
1090	3:00 p.m.	41_9	32 40.7	117 27.3	0	20.55	2714	2580	2370	33.78
1091	4:10 p.m.	41_9	32 40.0	117 26.0	0	20.3	2720	2586	2382	33.85

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: $S\frac{0°}{4°}$	Specific gravity: $S\frac{17°5}{17°5}$	Specific gravity: $S\frac{t°}{4°}$	Salinity S ‰
				July 2, 1909						
1092	4:35 p.m.	41_8	32° 40.0	117° 26.0	0	20°4	2716	2582	2376	33.80
1093	5:05 p.m.	41_8	32 40.0	117 26.0	0	20.2	2713	2579	2379	33.76
1094	5:30 p.m.	41_8	32 40.0	117 26.0	0	20.0	2711	2577	2382	33.74
1095	6:15 p.m.	41_8	32 40.0	117 26.0	0	20.15	2709	2575	2377	33.71
1096	7:55 p.m.	39_7	32 37.1	117 14.5	0	18.3	2717	2583	2431	33.81
1097	8:13 p.m.	B	32 41.0	117 13.9	0	17.8	2725	2590	2451	33.91
1098	8:20 p.m.	B	32 42.1	117 14.1	0	16.9	2721	2587	2468	33.86
1099	8:33 p.m.	B	32 42.9	117 12.9	0	18.0	2728	2593	2450	33.95
1100	8:42 p.m.	B	32 42.9	117 11.7	0	18.5	2735	2600	2444	34.04
1101	9:00 p.m.	B	32 42.6	117 10.7	0	20.4	2762	2626	2419	34.37
				July 3, 1909						
1102	6:00 a.m.	B	32 42.6	117 10.7	0	21.5	2793	2655	2419	34.76
				July 7, 1909						
1103	4:45 a.m.	42_{10}	32 52.0	117 30.0	0	19.0	2718	2584	2414	33.83
1104	5:30 a.m.	42_{10}	32 52.0	117 30.0	0	19.1	2722	2588	2416	33.87
1105	6:40 a.m.	42_9	32 52.0	117 30.0	0	19.0	2712	2578	2409	33.75
1106	6:10 p.m.	40_{11}	32 53.2	117 20.0	0	19.1	2720	2586	2414	33.85
1107	7:00 p.m.	40_{11}	32 53.2	117 20.0	0	19.3	2712	2578	2402	33.75
1108	8:00 p.m.	40_{11}	32 53.2	117 20.0	0	19.4	2713	2579	2400	33.76
1109	8:30 p.m.	40_{11}	32 53.2	117 20.0	0	19.6	2716	2582	2396	33.80
				July 8, 1909						
1110	11:50 a.m.	$(40)_{10}$	32 52.0	117 19.2	0	19.2	2717	2583	2407	33.81
1111	2:15 p.m.	$(40)_{10}$	32 52.1	117 18.4	0	19.6	2711	2577	2392	33.74
				July 9, 1909						
1112	3:28 a.m.	$(40)_{11}$	32 52.3	117 20.0	0	18.7	2713	2579	2419	33.76
1113	4:15 a.m.	$(40)_{10}$	32 52.3	117 20.0	0	18.8	2706	2573	2407	33.68
1114	5:15 a.m.	$(40)_{11}$	32 52.3	117 20.0	0	18.6	2705	2572	2412	33.66
1115	6:28 a.m.	$(40)_{10}$	32 52.3	117 20.0	0	18.6	2720	2586	2427	33.85
1116	7:01 p.m.	$(40)_{10}$	32 52.3	117 20.0	0	19.0	2707	2574	2403	33.69
1117	7:43 p.m.	$(40)_{11}$	32 52.3	117 20.0	0	18.8	2709	2575	2411	33.71
1118	8:17 p.m.	$(40)_{10}$	32 52.3	117 20.0	0	18.9	2711	2577	2411	33.74
1119	11:36 p.m.	$(40)_{11}$	32 52.3	117 20.0	0	19.0	2709	2575	2406	33.71
				July 10, 1909						
1120	12:46 a.m.	$(40)_{10}$	32 52.3	117 20.0	0	18.9	2710	2576	2409	33.73
1121	4.26 a.m.	40_{11}	32 53.0	117 18.0	0	19.2	2718	2584	2410	33.83
1122	5:21 a.m.	40_{11}	32 53.0	117 18.0	0	19.1	2713	2579	2408	33.76
1123	6:00 a.m.	40_{11}	32 53.0	117 18.0	0	19.2	2716	2582	2409	33.80
1124	9:00 a.m.	(39_{11})	32 51.8	117 17.2	0	19.9	2717	2583	2390	33.81
1125	9:05 a.m.	(39_{11})	32 51.8	117 17.2	1	19.9	2716	2582	2389	33.80
				July 14, 1909						
1126	10:00 a.m.	(39_{10})	32 51.8	117 17.2	0	20.1	2713	2579	2381	33.76
				July 15, 1909						
1127	10:00 a.m.	(39_{10})	32 51.8	117 17.2	0	20.8	2715	2581	2363	33.79
1128	10:30 a.m.	(39_{10})	32 50.9	117 16.5	0	.....	2714	2580	.....	33.78
				July 16, 1909						
1129	10:00 a.m.	(39_{11})	32 51.8	117 17.2	0	20.4	2718	2584	2377	33.83
1130	10:30 a.m.	(39_{10})	32 50.9	117 16.5	0	.....	2718	2584	.....	33.83
				July 19, 1909						
1131	3:15 p.m.	(39_{10})	32 50.9	117 16.5	0	20.25	2716	2582	2381	33.80
				July 22, 1909						
1132	2:00 p.m.	(39_{11})	32 50.9	117 16.5	0	20.2	2716	2582	2382	33.80
				July 25, 1909						
1133	12:01 p.m.	(39_{10})	32 51.8	117 17.2	0	20.2	2706	2573	2371	33.68
1134	12:30 p.m.	(39_{10})	32 50.9	117 16.5	0	19.5	2707	2574	2391	33.69
				July 27, 1909						
1135	2:00 p.m.	(39_{10})	32 50.9	117 16.5	0	19.2	2704	2571	2396	33.65
1136	2:30 p.m.	(39_{11})	32 51.8	117 17.2	0	20.6	2712	2578	2367	33.75
				Aug. 31, 1909						
1137	2:40 a.m.	(39_{10})	32 51.1	117 16.7	0	19.8	2690	2557	2367	33.48h
1138	3:00 a.m.	$(40)_{10}$	32 50.1	117 19.9	0	20.0	.....	.....	.....	.....
1139	3:20 a.m.	$(40)_{11}$	32 49.7	117 21.8	0	19.9	2695	2562	2368	33.54h
1140	3:40 a.m.	41_{10}	32 48.5	117 25.5	0	20.2	2701	2568	2367	33.61h
1141	4:00 a.m.	42_{10}	32 47.7	117 28.2	0	19.95	2686	2553	2360	33.42h
1142	4:20 a.m.	42_9	32 46.8	117 30.8	0	20.6	2710	2576	2365	33.73h
1143	4:40 a.m.	43_9	32 46.0	117 33.7	0	20.7	2698	2565	2349	33.58h
1144	5:00 a.m.	43_9	32 45.1	117 36.4	0	20.2	2680	2548	2348	33.35h
1145	5:20 a.m.	44_9	32 44.3	117 38.9	0	20.1	2681	2549	2351	33.37h

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position		Depth in meters	Temperature in centigrade	Specific gravity			Salinity S ‰
			North latitude	West longitude			0° S/4°0	17°5 S/17°5	t° S/4°0	
				Aug. 31, 1909						
1146	5:40 a.m.	44_9	32° 43.5	117° 41.8	0	20.5	2691	2558	2346	33.49h
1147	6:00 a.m.	45_9	32 42.7	117 44.5	0	19.7	2678	2546	2359	33.33h
1148	6:20 a.m.	45_8	32 41.7	117 47.3	0	18.7	2681	2549	2388	33.37h
1149	6:40 a.m.	46_8	32 40.9	117 50.2	0	18.55	2679	2547	2390	33.34h
1150	7:00 a.m.	47_8	32 40.0	117 52.9	0	18.7	2682	2550	2389	33.38h
1151	7:20 a.m.	47_7	32 39.2	117 56.6	0	18.55	2681	2549	2392	33.37h
1152	7:40 a.m.	48_7	32 38.4	117 58.3	0	18.8	2678	2546	2382	33.33h
1153	8:00 a.m.	48_8	32 37.6	118 0.8	0	18.6	2699	2566	2406	33.59h
1154	8:20 a.m.	49_7	32 36.9	118 3.2	0	18.55	2687	2554	2398	33.44h
1155	8:40 a.m.	49_8	32 38.5	118 5.3	0	18.15	.....	.....	.....	.....
1156	9:00 a.m.	50_8	32 40.2	118 7.6	0	19.8	2682	2550	2360	33.38h
1157	9:20 a.m.	50_9	32 42.0	118 10.0	0	20.8	2699	2566	2348	33.59h
1158	9:40 a.m.	50_{10}	32 43.4	118 12.0	0	21.2	2712	2578	2351	33.75h
1159	10:00 a.m.	51_9	32 45.0	118 14.0	0	21.3	2707	2574	2343	33.69h
1160	10:20 a.m.	51_9	32 46.7	118 16.1	0	21.3	2701	2568	2337	33.62h
1161	10:40 a.m.	52_{10}	32 48.2	118 18.1	0	20.6	2691	2558	2348	33.49h
1162	11:00 a.m.	52_{10}	32 50.0	118 20.6	0	21.0	2709	2575	2353	33.71h
1163	11:20 a.m.	52.5_{10}	32 51.6	118 22.5	0	20.2	2700	2567	2365	33.60h
1164	11:40 a.m.	53_{11}	32 53.1	118 24.5	0	20.8	2700	2567	2349	33.60h
1165	12:01 p.m.	53_{11}	32 53.1	118 24.5	0	20.4	2687	2554	2349	33.44h
1166	12:20 p.m.	53_{11}	32 53.1	118 24.5	0	20.4	2687	2554	2349	33.44h
1167	12:40 p.m.	53_{11}	32 53.1	118 24.5	0	20.4	2700	2567	2360	33.60h
1168	1:00 p.m.	53_{11}	32 53.1	118 24.5	0	20.4	.....	.....	.....	.....
1169*	1:05 p.m.	53_{11}	32 53.1	118 24.6	0	20.8	.....	.....	.....	.....
1170*	1:10 p.m.	53_{11}	32 53.0	118 24.6	0	20.75	2722	2588	2372	33.88h
1171*	1:15 p.m.	53_{11}	32 53.0	118 24.7	0	20.65	2724	2589	2377	33.90h
1172*	1:20 p.m.	53_{11}	32 52.9	118 24.7	0	20.65	2721	2587	2375	33.86h
1173	1:20 p.m.	53_{11}	32 53.1	118 24.5	0	20.4	2701	2568	2361	33.61h
1174*	1:25 p.m.	53_{11}	32 52.8	118 24.8	0	20.6	2701	2568	2356	33.62h
1175	1:28 p.m.	53_{11}	32 53.1	118 24.5	550	.....	2769	2632	.....	34.46h
1176*	1:30 p.m.	53_{11}	32 52.8	118 24.8	0	20.75	2682	2550	2336	33.38h
1177*	1:35 p.m.	53_{11}	32 52.7	118 24.9	0	20.8	2699	2566	2349	33.59h
1178*	1:40 p.m.	53_{11}	32 52.6	118 24.9	0	20.9	2702	2569	2349	33.63h
1179*	1:45 p.m.	53_{11}	32 52.6	118 25.0	0	20.8	2695	2562	2344	33.54h
1180	1:50 p.m.	53_{11}	32 53.1	118 24.5	0	20.4	2724	2589	2384	33.90h
1181*	1:50 p.m.	$53_{10.5}$	32 52.5	118 25.0	0	21.2	2703	2570	2343	33.64h
1182*	1:55 p.m.	$53_{10.5}$	32 52.5	118 25.1	0	21.1	2703	2570	2345	33.64h
1183*	2:00 p.m.	53_{10}	32 52.4	118 25.2	0	21.3	2700	2567	2337	33.60h
1184	2:00 p.m.	53_{11}	32 53.1	118 24.5	0	20.4	2722	2588	2383	33.88h
1185	2:10 p.m.	53_{11}	32 53.1	118 24.5	460	.....	2760	2624	.....	34.35hK
1186	2:20 p.m.	53_{11}	32 53.1	118 24.5	0	20.4	2722	2588	2382	33.88h
1187	2:21 p.m.	53_{11}	32 53.1	118 24.5	275	8.9	2752	2616	2657	34.25hK
1188	2:40 p.m.	53_{11}	32 53.1	118 24.5	0	20.4	.....	.....	.....	.....
1189	3:00 p.m.	53_{11}	32 53.1	118 24.5	0	20.2	2711	2577	2377	33.75h
1190	3:02 p.m.	53_{11}	32 53.1	118 24.5	92	9.4	2717	2583	2615	33.81hK
1191	3:10 p.m.	53_{11}	32 53.1	118 24.5	135	9.1	2732	2597	2634	34.00hK
1192	3:20 p.m.	53_{11}	32 53.1	118 24.5	0	20.2	2697	2564	2361	33.56h
1193	3:25 p.m.	53_{11}	32 53.1	118 24.5	46	11.9	2692	2559	2547	33.50hK
1194	3:40 p.m.	53_{11}	32 52.9	118 23.4	0	20.4	2716	2582	2376	33.80h
1195	4:00 p.m.	52_{10}	32 51.3	118 21.9	0	20.8	2712	2578	2362	33.75h
1196	4:20 p.m.	52_{10}	32 50.2	118 21.0	0	21.0	2713	2579	2357	33.76h
1197	4:40 p.m.	52_{10}	32 48.5	118 21.8	0	18.6	2706	2573	2413	33.68h
1198	5:00 p.m.	53_{10}	32 49.0	118 23.8	0	17.6	2714	2580	2446	33.78h
1199	6:00 p.m.	53_{11}	32 49.0	118 23.8	0	18.2	2715	2581	2432	33.79h
				Sept. 1, 1909						
1200	5:00 a.m.	53_{11}	32 49.0	118 23.8	0	16.5	2707	2574	2464	33.69h
1201	5:20 a.m.	53_{10}	32 47.8	118 24.5	0	17.2	.....	.....	.....	.....
1202	5:40 a.m.	53_{10}	32 47.7	118 25.8	0	17.2	2695	2562	2436	33.54h
1203	6:00 a.m.	53_9	32 47.3	118 27.3	0	16.6	2695	2562	2450	33.54h
1204	6:20 a.m.	54_{10}	32 48.0	118 28.3	0	17.2	2709	2575	2450	33.71h
1205	6:40 a.m.	54_{10}	32 48.8	118 30.4	0	16.4	2687	2554	2450	33.44h
1206	7:02 a.m.	54_{10}	32 50.0	118 31.3	0	18.3	2692	2559	2407	33.50h

* Sample taken from rowboat off San Clemente Island.

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° S 4°0	Specific gravity: 17°5 S 17°5	Specific gravity: t° S 4°0	Salinity S ‰
				Sept. 1, 1909						
1207	7:20 a.m.	54_{10}	32° 50.4	118° 32.0	0	18.6	2697	2564	2404	33.57h
1208	7:22 a.m.	54_{10}	32 50.4	118 32.0	92	9.8	2726	2591	2618	33.92hK
1209	7:26 a.m.	54_{10}	32 50.4	118 32.0	46	11.4	2691	2558	2556	33.49hK
1210	7:40 a.m.	55_{10}	32 50.8	118 33.6	0	18.7	2701	2568	2406	33.61h
1211	8:00 a.m.	55_{10}	32 51.2	118 35.5	0	19.2	2719	2585	2410	33.84h
1212	8:20 a.m.	55_{10}	32 51.2	118 35.5	0	19.2	2704	2571	2396	33.65h
1213	8:22 a.m.	55_{10}	32 51.2	118 35.5	475	.....	2752	2616	.....	34.25hK
1214	8:38 a.m.	55_{10}	32 51.2	118 35.5	410	.....	2753	2617	.....	34.26hK
1215	8:40 a.m.	55_{10}	32 51.2	118 35.5	0	19.2	2708	2574	2400	33.70h
1216	8:49 a.m.	55_{10}	32 51.2	118 35.5	275	7.9	2753	2617	2673	34.26hK
1217	8:56 a.m.	55_{10}	32 51.2	118 35.5	135	.....	2753	2617	.....	34.26hK
1218	9:00 a.m.	55_{10}	32 51.2	118 35.5	0	19.2	2718	2584	2410	33.83h
1219	9:02 a.m.	55_{10}	32 51.2	118 35.5	92	9.5	.....	.....	.....	K
1220	9:04 a.m.	55_{10}	32 51.2	118 35.5	46	11.7	2701	2568	2585	33.61hK
1221	9:24 a.m.	55_{11}	32 53.2	118 36.8	0	18.6	2718	2584	2425	33.83h
1222	9:44 a.m.	56_{11}	32 55.2	118 38.3	0	18.5	2703	2570	2413	33.64h
1223	10:00 a.m.	56_{11}	32 56.8	118 39.7	0	17.8	2707	2574	2434	33.69h
1224	10:20 a.m.	56_{12}	32 59.0	118 40.8	0	18.8	.....	.....	.....	.....
1225	10:40 a.m.	56_{12}	33 0.0	118 41.2	0	17.4	2698	2565	2434	33.58h
1226	11:00 a.m.	56_{12}	33 0.0	118 41.2	0	17.6	2703	2570	2435	33.64h
1227	11:03 a.m.	56_{12}	33 0.0	118 41.2	550	.....	2764	2628	.....	34.40hK
1228	11:20 a.m.	56_{12}	33 0.0	118 41.2	0	17.6	2705	2572	2437	33.66h
1229	11:40 a.m.	56_{12}	33 0.0	118 41.2	0	17.8	2686	2553	2414	33.43h
1230	11:43 a.m.	56_{12}	33 0.0	118 41.2	365	.....	2762	2526	.....	34.37hK
1231	12:01 p.m.	56_{12}	33 0.0	118 41.2	0	18.0	2699	2566	2421	33.59h
1232	12:08 p.m.	56_{12}	33 0.0	118 41.2	275	8.5	2762	2526	2672	34.37hK
1233	12:20 p.m.	56_{12}	33 0.0	118 41.2	185	9.5	2764	2528	2659	34.40hK
1234	12:20 p.m.	56_{12}	33 0.0	118 41.2	0	18.0	2699	2566	2421	33.59h
1235	12:30 p.m.	56_{12}	33 0.0	118 41.2	46	11.0	2709	2575	2580	33.71hK
1236	12:34 p.m.	56_{12}	33 0.0	118 41.2	18	12.9	.....	.....	.....	K
1237	12:40 p.m.	56_{12}	33 0.0	118 41.2	0	18.4	.....	.....	.....	.....
1238	1:00 p.m.	56_{12}	33 0.0	118 41.2	0	18.5	.....	.....	.....	.....
1239	1:20 p.m.	56_{12}	33 0.0	118 41.2	0	18.6	.....	.....	.....	.....
1240	1:40 p.m.	56_{12}	33 1.4	118 40.0	0	18.6	2718	2584	2425	33.83h
1241	2:00 p.m.	55_{13}	33 3.2	118 36.5	0	.....	2720	2586	.....	33.85h
1242	2:20 p.m.	55_{12}	33 1.4	118 33.1	0	19.6	2718	2584	2399	33.83h
1243	2:40 p.m.	54.5_{12}	33 0.0	118 32.5	0	19.6	2704	2571	2385	33.65h
1244	3:00 p.m.	54_{12}	32 58.4	118 31.4	0	19.9	.....	.....	.....	.....
1245	3:20 p.m.	54_{11}	32 57.0	118 30.2	0	19.8	2717	2583	2394	33.81h
1246	3:40 p.m.	54_{11}	32 55.6	118 28.8	0	20.9	.....	.....	.....	.....
1247	4:00 p.m.	53.5_{11}	32 54.5	118 27.5	0	21.0	2717	2583	2360	33.81h
1248	4:20 p.m.	53_{10}	32 52.0	118 26.0	0	20.8	.....	.....	.....	.....
1249	5:00 p.m.	53_{10}	32 52.0	118 26.0	0	20.5	.....	.....	.....	.....
1250	6:00 p.m.	53_{10}	32 52.0	118 26.0	0	19.9	2719	2585	2392	33.84h
1251	7:00 p.m.	53_{10}	32 52.0	118 26.0	0	19.8	.....	.....	.....	.....
				Sept. 2, 1909						
1252	2:20 a.m.	53_{10}	32 52.0	118 26.0	0	19.7	.....	.....	.....	.....
1253	3:00 a.m.	52_{10}	32 49.2	118 22.4	0	19.8	2719	2585	2395	33.84h
1254	3:20 a.m.	53_{9}	32 46.7	118 24.6	0	18.0	2720	2586	2441	33.85h
1255	3:40 a.m.	53_{9}	32 44.9	118 26.2	0	16.8	.....	.....	.....	.....
1256	4:00 a.m.	54_{9}	32 43.8	118 27.7	0	16.8	.....	.....	.....	.....
1257	4:20 a.m.	54_{9}	32 42.7	118 28.5	0	17.7	.....	.....	.....	.....
1258	4:40 a.m.	$54_{8.5}$	32 42.5	118 30.0	0	17.9	2720	2586	2443	33.85h
1259	5:00 a.m.	54_{8}	32 41.8	118 30.8	0	18.0	.....	.....	.....	.....
1260	5:20 a.m.	54_{8}	32 40.0	118 32.3	0	18.4	.....	.....	.....	.....
1261	5:40 a.m.	55_{8}	32 38.6	118 34.0	0	18.3	2701	2568	2416	33.61h
1262	6:00 a.m.	55_{7}	32 37.2	118 37.2	0	18.6	.....	.....	.....	.....
1263	6:20 a.m.	55_{7}	32 37.2	118 37.2	0	18.2	.....	.....	.....	.....
1264	6:40 a.m.	56_{7}	32 34.7	118 38.4	0	18.3	.....	.....	.....	.....
1265	7:00 a.m.	56_{7}	32 34.6	118 40.0	0	18.3	.....	.....	.....	.....
1266	7:20 a.m.	57_{7}	32 32.6	118 43.0	0	18.0	.....	.....	.....	.....
1267	7:40 a.m.	57_{8}	32 30.6	118 46.2	0	18.2	.....	.....	.....	.....
1268	8:00 a.m.	57_{8}	32 30.0	118 47.4	0	18.2	.....	.....	.....	.....
1269	8:20 a.m.	58_{6}	32 28.6	118 48.5	0	18.2	.....	.....	.....	.....

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0°/4°0	Specific gravity: 17°5/17°5	Specific gravity: t°/4°0	Salinity S ‰
				Sept. 2, 1909						
1270	8:40 a.m.	58_8	32° 28.0	118° 50.0	0	18°2	.....	.....	.....	.....
1271	9:00 a.m.	58_5	32 26.6	118 51.5	0	18.4	2718	2584	2430	33.83h
1272	9:20 a.m.	59_5	32 25.3	118 53.8	0	18.2	.....	.....	.....	.....
1273	9:40 a.m.	59_6	32 24.0	118 56.0	0	18.3	.....	.....	.....	.....
1274	10:00 a.m.	60_5	32 22.6	118 58.5	0	18.4	.....	.....	.....	.....
1275	10:09 a.m.	60_5	32 22.6	118 58.5	0	17.5	.....	.....	.....	.....
1276	10:17 a.m.	60_5	32 22.6	118 58.5	295	7.6	2755	2619	2480	34.28hK
1277	10:30 a.m.	60_5	32 22.6	118 58.5	220	7.8	2760	2624	2482	34.35hK
1278	10:30 a.m.	60_5	32 22.6	118 58.5	0	18.4	.....	.....	.....	.....
1279	10:37 a.m.	60_5	32 22.6	118 58.5	145	8.4	2748	2612	2661	34.20hK
1280	10:40 a.m.	60_5	32 22.6	118 58.5	73	11.9	2714	2580	2568	33.78hK
1281	10:43 a.m.	60_5	32 22.6	118 58.5	37	.....	2706	2573	.....	33.68hK
1282	11:00 a.m.	60_4	32 20.6	119 1.5	0	18.4	2719	2585	2431	33.84h
1283	11:20 a.m.	61_4	32 18.7	119 3.0	0	18.2	2712	2578	2429	33.75h
1284	11:40 a.m.	61_4	32 20.6	119 3.8	0	18.3	2721	2587	2437	33.86h
1285	12:01 p.m.	60_4	32 21.3	119 1.5	0	18.3	2722	2588	2436	33.88h
1286	12:20 p.m.	60_5	32 24.0	119 1.7	0	18.4	2720	2586	2432	33.85h
1287	12:37 p.m.	60_5	32 26.0	119 2.3	64	10.0	2722	2588	2610	33.88hK
1288	12:40 p.m.	60_5	32 26.0	119 2.3	46	12.5	2705	2572	2547	33.66hK
1289	12:40 p.m.	60_5	32 26.0	119 2.3	0	18.1	2720	2586	2440	33.85h
1290	12:43 p.m.	60_5	32 26.0	119 2.3	27	12.6	2720	2586	2559	33.85hK
1291	12:46 p.m.	60_5	32 26.0	119 2.3	37	12.1	2718	2584	2568	33.83hK
1292	12:49 p.m.	60_5	32 26.0	119 2.3	55	11.6	2709	2575	2569	33.71hK
1293	1:00 p.m.	60_5	32 26.7	119 2.4	0	18.1	.....	.....	.....	.....
1294	1:20 p.m.	61_5	32 28.0	119 3.0	0	18.0	.....	.....	.....	.....
1295	1:40 p.m.	61_5	32 28.0	119 3.0	365	.....	2772	2635	.....	34.50hK
1296	1:40 p.m.	61_5	32 28.0	119 3.0	0	17.9	2714	2580	2438	33.78h
1297	1:49 p.m.	61_5	32 28.0	119 3.0	325	.....	2758	2622	.....	34.32hK
1298	2:00 p.m.	61_6	32 28.0	119 3.0	0	18.2	2714	2580	2431	33.78h
1299	2:10 p.m.	61_6	32 28.0	119 3.0	230	8.5	.....	.....	.....	.....K
1300	2:40 p.m.	61_6	32 28.0	119 3.0	135	9.1	.....	.....	.....	.....K
1301	2:40 p.m.	61_6	32 28.0	119 3.0	0	18.3	2711	2577	2425	33.74h
1302	2:45 p.m.	61_6	32 28.0	119 3.0	92	10.3	2720	2586	2602	33.85hK
1303	2:47 p.m.	61_6	32 28.0	119 3.0	46	12.1	2705	2572	2555	33.66hK
1304	3:00 p.m.	60_6	32 29.3	119 1.0	0	18.4	2717	2583	2429	33.81h
1305	3:20 p.m.	60_6	32 30.6	118 58.5	0	18.2	2717	2583	2434	33.81h
1306	3:40 p.m.	59_6	32 31.3	118 57.0	0	18.3	2717	2583	2432	33.81h
1307	4:00 p.m.	59_7	32 33.0	118 53.8	0	18.4	2720	2586	2431	33.85h
1308	4:20 p.m.	58_7	32 33.4	118 52.3	0	18.2	2717	2583	2434	33.81h
1309	4:40 p.m.	58_7	32 34.6	118 50.8	0	18.6	2719	2585	2426	33.84h
1310	5:00 p.m.	58_7	32 35.3	118 49.2	0	18.4	2709	2575	2422	33.71h
1311	5:20 p.m.	58_7	32 36.0	118 47.6	0	18.6	2712	2578	2418	33.75h
1312	5:44 p.m.	57_7	32 36.6	118 45.8	0	18.6	2715	2581	2421	33.79h
1313	6:00 p.m.	57_7	32 37.3	118 43.0	0	18.6	.....	.....	.....	.....
1314	6:20 p.m.	56_7	32 40.0	118 39.2	0	18.6	2722	2588	2428	33.88h
1315	6:40 p.m.	56_8	32 40.0	118 39.2	0	18.2	2712	2578	2429	33.75h
1316	7:00 p.m.	56_8	32 41.3	118 37.6	0	18.4	2711	2577	2422	33.74h
1317	7:20 p.m.	55_9	32 42.6	118 35.4	0	18.4	2711	2577	2422	33.74h
1318	7:40 p.m.	55_9	32 43.4	118 33.8	0	17.2	.....	.....	.....	.....
1319	8:00 p.m.	54_9	32 44.5	118 31.6	0	17.0	.....	.....	.....	.....
1320	8:20 p.m.	54_9	32 45.2	118 30.0	0	20.4	.....	.....	.....	.....
				Sept. 3, 1909						
1321	5:20 a.m.	53_{10}	32 49.2	118 23.8	0	17.9	.....	.....	.....	.....
1322	5:40 a.m.	52_{10}	32 48.8	118 22.2	0	18.2	2713	2579	2429	33.76h
1323	6:00 a.m.	52_{10}	32 48.5	118 20.3	0	19.3	.....	.....	.....	.....
1324	6:16 a.m.	52_{10}	32 48.5	118 20.3	0	19.5	.....	.....	.....	.....
1325	7:00 a.m.	51_{10}	32 48.7	118 16.1	0	19.0	.....	.....	.....	.....
1326	7:30 a.m.	50_{10}	32 49.0	118 10.5	0	18.0	2716	2582	2438	33.80h
1327	8:00 a.m.	49_{10}	32 49.3	118 4.8	0	18.4	.....	.....	.....	.....
1328	8:20 a.m.	49_{10}	32 49.4	118 3.8	0	18.0	2717	2583	2439	33.81h
1329	8:40 a.m.	48_{10}	32 49.6	118 2.3	0	18.1	2700	2567	2420	33.60h
1330	9:00 a.m.	48_{10}	32 49.8	118 1.9	0	18.1	2692	2559	2412	33.50h
1331	9:20 a.m.	48_{10}	32 50.1	118 1.5	0	18.2	2719	2585	2437	33.84h
1332	9:40 a.m.	48_{11}	32 50.4	118 1.0	0	18.2	.....	.....	.....	.....

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position		Depth in meters	Temperature in centigrade	Specific gravity			Salinity S ‰
			North latitude	West longitude			S 0°/4°0	S 17°5/17°5	S t°/4°0	
				Sept. 3, 1909						
1333	10:00 a.m.	48_{10}	32° 51.0	117° 59.6	0	18°.2	2723	2588	2440	33.89h
1334	10:40 a.m.	48_{10}	32 51.1	117 59.7	0	18.2	.....	.....	.....	.....
1335	11:00 a.m.	48_{10}	32 51.2	117 59.1	0	18.4	.....	.....	.....	.....
1336	11:20 a.m.	48_{10}	32 51.4	117 58.4	0	18.5	2712	2578	2421	33.75h
1337	11:40 a.m.	48_{10}	32 51.5	117 58.2	0	18.5	2713	2579	2423	33.76h
1338	12:01 p.m.	48_{10}	32 51.5	117 57.8	0	18.6	2703	2570	2410	33.64h
1339	12:40 p.m.	47_{10}	32 50.1	117 57.0	0	18.6	2719	2585	2425	33.84h
1340	1:00 p.m.	47_{10}	32 52.4	117 56.6	0	18.8	2719	2585	2421	33.84h
1341	1:20 p.m.	$47_{10.5}$	32 52.5	117 56.1	0	18.8	2718	2584	2420	33.83h
1342	1:40 p.m.	47_{11}	32 52.8	117 55.6	0	18.8	2723	2588	2425	33.89h
1343	2:00 p.m.	47_{11}	32 53.0	117 55.1	0	18.9	2722	2588	2421	33.88h
1344	2:20 p.m.	47_{11}	32 53.2	117 54.8	0	19.0	2713	2579	2410	33.76h
1345	2:40 p.m.	47_{11}	32 53.4	117 54.3	0	18.8	. . .	. ....	.....	. . .
1346	3:00 p.m.	47_{11}	32 53.6	117 53.7	0	18.9	2713	2579	2413	33.76h
1347	3:20 p.m.	47_{11}	32 53.8	117 53.4	0	19.0	2709	2575	2406	33.71h
1348	3:40 p.m.	47_{11}	32 54.0	117 53.0	0	19.0	2705	2572	2402	33.66h
1349	4:00 p.m.	46_{11}	32 53.0	117 50.2	0	19.2	2705	2572	2397	33.66h
1350	4:20 p.m.	45_{11}	32 53.6	117 47.2	0	19.3	2712	2588	2401	33.75h
1351	4:40 p.m.	45_{11}	32 53.2	117 44.1	0	18.9	2711	2587	2411	33.74h
1352	5:00 p.m.	44_{11}	32 53.1	117 41.1	0	19.3	2716	2582	2405	33.80h
1353	5:20 p.m.	44_{11}	32 52.9	117 38.8	0	19.7	2714	2580	2394	33.78h
1354	5:40 p.m.	43_{11}	32 52.6	117 34.9	0	19.9	2719	2585	2392	33.84h
1355	6:00 p.m.	42_{10}	32 52.4	117 31.7	0	20.0	2719	2585	2390	33.84h
1356	6:20 p.m.	42_{10}	32 52.0	117 30.0	0	20.1	2721	2587	2388	33.86h
1357	6:40 p.m.	42_{10}	32 52.0	117 30.0	0	20.2	2714	2580	2380	33.78h
1358	7:00 p.m.	42_{10}	32 52.0	117 28.0	0	19.8	2704	2571	2380	33.65h
1359	7:20 p.m.	41_{10}	32 51.9	117 25.1	0	19.6	.....	. ....	.....	.. ....
1360	7:40 p.m.	$(40)_{10}$	32 51.6	117 22.4	0	18.8	.....	. .....	.... ..	
1361	8:00 p.m.	$(40)_{10}$	32 51.2	117 19.5	0	18.8	.....	. ....	.... ..	. .....
1362	8:20 p.m.	(39_{10})	32 51.0	117 17.0	0	18.6	. ....	.. ....	.....	.. ....
				Sept. 27, 1909						
1363	8:43 a.m.	(39.5_{10})	32 51.2	117 17.5	0	19.4	2711	2577	2398	33.74h
				Oct. 4, 1909						
1364	9:10 a.m.	(39.5_{10})	32 51.2	117 17.5	0	18.0	2712	2578	2434	33.75h
1365	9:30 a.m.	(39.5_{10})	32 51.2	117 17.5	0	18.2	2720	2586	2440	33.85h
				Oct. 11, 1909						
1366	9:00 a.m.	(39.5_{10})	32 51.2	117 17.5	0	19.0	.....	....	.... ..	.. ..
1367	9:20 a.m.	(39.5_{10})	32 51.2	117 17.5	0	19.2	....	....	.... .	.. ....
				Oct. 18, 1909						
1368	8:55 a.m.	(39.5_{10})	32 51.2	117 17.5	0	19.9	.....	. .. .	. .....	. ....
1369	9:15 a.m.	(39.5_{10})	32 51.2	117 17.5	0	19.9	.....	. ....	.....	.. ....
				Nov. 2, 1909						
1370	3:00 a.m.	(39_8)	32 38.5	117 13.8	0	16.4	....	. . ...	.... .	. . ....
1371	3:30 a.m.	(39_8)	32 37.6	117 15.0	0	16.6	.....	.. ....	.....	.. ....
1372	4:00 a.m.	40_9	32 40.5	117 17.9	0	17.0	.....	. ....	.....	.. ....
1373	4:30 a.m.	40_9	32 43.2	117 20.9	0	17.2	.... .	.....	.....	. ....
1374	5:00 a.m.	41_9	32 46.2	117 23.9	0	17.4	.....	.....	.....	.. ....
1375	5:30 a.m.	41_{10}	32 49.0	117 26.9	0	17.4	.... ..	.....	.....	.. ....
1376	6:00 a.m.	42_{10}	32 52.0	117 30.0	0	17.5	.....	.....	.....	.....
1377	6:20 a.m.	42_{10}	32 52.0	117 30.0	0	17.4	.....	.....	.....	.....
1378	7:00 a.m.	42_{10}	32 52.0	117 30.0	0	17.4	.....	.....	.....	. ....
1379	7:30 a.m.	42_{10}	32 52.0	117 30.0	0	17.4	.....	.....	.... ..	.. ....
1380	8:05 a.m.	42_{10}	32 52.0	117 30.0	0	17.6	.....	.....	.....	.....
1381	8:30 a.m.	42_{10}	32 52.0	117 30.0	0	17.6	.....	.....	.....	.. ....
1382	9:00 a.m.	42_{10}	32 52.0	117 30.0	0	17.6	.....	.....	.....	.. ....
1383	9:30 a.m.	42_{10}	32 52.0	117 30.0	0	17.7	.....	.. ....	.....	. ....
1384	10:00 a.m.	42_{10}	32 52.0	117 30.0	0	17.8	.....	.. ....	. .	.. ....
1385	10:20 a.m.	42_{10}	32 52.0	117 30.0	365	.....	2766	2630	.....	34.42hK
1386	10:34 a.m.	42_{10}	32 52.0	117 30.0	185	.....	2750	2614	.....	34.22hK
1387	11:00 a.m.	42_{10}	32 52.0	117 30.0	0	17.9	.....	.. ....	.. ....	.. ....
1388	11:30 a.m.	42_{10}	32 52.0	117 28.0	0	18.4	.....	.. ....	.....	. .
1389	12:01 p.m.	41_{10}	32 52.0	117 26.0	0	18.8	.....	.....	.....	. .
1390	12:47 p.m.	41_{11}	32 53.2	117 24.0	0	19.0	.....	.....	.....	.....
1391	1:00 p.m.	40.5_{11}	32 53.8	117 22.5	0	18.0	.....	.....	.....	.....
1392	1:12 p.m.	40.5_{11}	32 53.8	117 22.5	365	.....	2761	2625	.....	34.36hK

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: $S\frac{0°}{4°0}$	Specific gravity: $S\frac{17°5}{17°5}$	Specific gravity: $S\frac{t°}{4°0}$	Salinity S ‰
				Nov. 2, 1909						
1393	1:32 p.m.	40.5_{11}	32° 53'8	117° 22'5	185	.....	2761	2625	.....	34.36hK
1394	2:00 p.m.	40_{11}	32 53.0	117 20.9	0	19.0	.....	.....	.....	.....
1395	2:30 p.m.	(39_{10})	32 51.1	117 16.2	0	18.8	.....	.....	.....	.....
				Nov. 3, 1909						
1396	12:30 p.m.	(39_{10})	32 51.1	117 16.2	0	17.6	.....	.....	.....	.....
1397	1:00 p.m.	$(40)_{10}$	32 51.6	117 18.8	0	18.0	.....	.....	.....	.....
1398	1:30 p.m.	$(40)_{10}$	32 51.8	117 22.2	0	19.2	.....	.....	.....	.....
1399	2:00 p.m.	41_{10}	32 51.9	117 25.8	0	19.8	.....	.....	.....	.....
1400	2:30 p.m.	42_{10}	32 52.0	117 29.3	0	19.2	.....	.....	.....	.....
1401	3:05 p.m.	42_{10}	32 52.0	117 30.0	0	19.2	.....	.....	.....	.....
1402	4:00 p.m.	42_{11}	32 52.7	117 30.0	0	18.9	.....	.....	.....	.....
1403	4:30 p.m.	42_{11}	32 53.2	117 30.0	0	18.8	.....	.....	.....	.....
1404	5:00 p.m.	42_{11}	32 53.6	117 30.0	0	18.6	.....	.....	.....	.....
1405	6:00 p.m.	42_{11}	32 54.1	117 30.0	0	18.0	.....	.....	.....	.....
				Nov. 4, 1909						
1406	8:30 a.m.	(39_{10})	32 51.1	117 16.2	0	17.2	.....	.....	.....	.....
1407	9:00 a.m.	(39.5_{10})	32 50.5	117 17.5	0	17.4	.....	.....	.....	.....
1408	9:30 a.m.	$(40)_{10}$	32 47.6	117 21.1	0	17.4	.....	.....	.....	.....
1409	10:00 a.m.	41_9	32 45.7	117 23.6	0	17.4	.....	.....	.....	.....
1410	10:20 a.m.	41_9	32 44.4	117 25.4	0	17.4	.....	.....	.....	.....
1411	10:40 a.m.	41_9	32 43.2	117 26.9	0	17.4	.....	.....	.....	.....
1412	11:00 a.m.	42_8	32 41.9	117 28.8	0	17.3	.....	.....	.....	.....
1413	12:01 p.m.	42_8	32 40.6	117 30.3	0	17.7	.....	.....	.....	.....
1414	2:00 p.m.	42_8	32 40.6	117 30.3	0	17.6	.....	.....	.....	.....
1415	2:05 p.m.	42_8	32 40.6	117 30.3	185	9.7	.....	.....	.....	.....K
1416	2:16 p.m.	42_8	32 40.6	117 30.3	46	11.9	.....	.....	.....	.....K
1417	2:20 p.m.	42_8	32 40.6	117 30.3	0	17.6	.....	.....	.....	.....
1418	2:40 p.m.	41_8	32 40.4	117 26.5	0	17.6	.....	.....	.....	.....
1419	3:00 p.m.	41_8	32 40.2	117 23.2	0	17.6	.....	.....	.....	.....
1420	3:12 p.m.	40_8	32 40.0	117 22.0	185	9.2	2741	2606	2642	34.11hK
1421	3:19 p.m.	40_8	32 40.0	117 22.0	135	9.8	2736	2601	2627	34.05hK
1422	3:20 p.m.	40_8	32 40.0	117 22.0	0	17.7	.....	.....	.....	.....
1423	3:24 p.m.	40_8	23 40.0	117 22.0	92	10.7	.....	.....	.....	.....K
1424	3:28 p.m.	40_8	32 40.0	117 22.0	46	12.8	2698	2565	2542	33.58hK
1425	3:40 p.m.	40_8	32 40.0	117 20.5	0	17.4	.....	.....	.....	.....
1426	4:00 p.m.	40_8	32 39.6	117 17.6	0	17.6	.....	.....	.....	.....
				Nov. 5, 1909						
1427	6:10 a.m.	B	32 40.0	117 14.0	0	16.0	....	....	....	.....
1428	6:40 a.m.	(39_8)	32 39.4	117 16.3	0	16.6	2691	2558	2446	33.49h
1429	7:00 a.m.	40_8	32 39.6	117 18.5	0	17.3	2698	2565	2437	33.58h
1430	7:40 a.m.	41_8	32 40.0	117 22.7	0	17.3	2697	2564	2436	33.57h
1431	8:00 a.m.	41_8	32 40.2	117 24.8	0	17.4	2701	2568	2437	33.61h
1432	8:20 a.m.	41_8	32 40.3	117 27.0	0	17.5	2703	2571	2437	33.64h
1433	8:40 a.m.	42_8	32 40.5	117 29.0	0	17.4	2700	2567	2437	33.60h
1434	9:00 a.m.	42_8	32 40.6	117 30.3	0	17.7	2705	2572	2434	33.66h
1435	10:00 a.m.	42_8	32 40.6	117 30.3	0	17.6	.....	.....	.....	.....
1436	11:00 a.m.	42_8	32 40.6	117 30.3	0	17.6	....	....	....	.....
1437	12:01 p.m.	42_8	32 40.6	117 30.3	0	17.6	2700	2567	2431	33.60h
1438	1:00 p.m.	42_8	32 40.6	117 30.3	0	17.5	.....	.....	.....	.....
				Dec. 8, 1909						
1439	8:50 a.m.	(39.5_{13})	32 51.2	117 17.5	0	13.6	.....	.....	.....	.....
				Dec. 24, 1909						
1440	8:40 a.m.	(39.5_{10})	32 51.2	117 17.5	0	14.1	.....	.....	.....	.....
1441	8:50 a.m.	(39.5_{10})	32 51.2	117 17.5	0	14.1	.....	.....	.....	.....
				Jan. 16, 1910						
1442	10:00 a.m.	(39.5_{10})	32 51.2	117 17.5	0	13.7	2688	2555	2508	33.45
1443	10:15 a.m.	(39.5_{10})	32 51.2	117 17.5	0	13.4	2698	2565	2523	33.58
				Feb. 3, 1910						
1444	9:00 a.m.	(39.5_{10})	32 51.2	117 17.5	0	12.7	2697	2564	2545	33.57
1445	9:20 a.m.	(39.5_{10})	32 51.2	117 17.5	0	12.7	2696	2563	2544	33.55
				Feb. 17, 1910						
1446	4:20 a.m.	39_7	32 37.1	117 15.2	0	12.1	.....	.....	.....	.....
1447	4:42 a.m.	40_7	32 37.3	117 18.0	0	12.4	.....	.....	.....	.....
1448	5:05 a.m.	40_8	32 37.6	117 20.7	0	12.6	.....	.....	.....	.....
1449	5:20 a.m.	40_8	32 37.9	117 22.4	0	12.6	.....	.....	.....	.....
1450	5:40 a.m.	41_8	32 38.2	117 24.9	0	12.9	.....	.....	.....	.....

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position		Depth in meters	Temperature in centigrade	Specific gravity			Salinity S ‰
			North latitude	West longitude			0° S 4°0	17°5 S 17°5	t° S 4°0	
				Feb. 17, 1910						
1451	6:00 a.m.	41_8	32° 38.5	117° 27.2	0	12°8				
1452	6:20 a.m.	42_2	32 38.6	117 28.5	0	13.1				
1453	8:20 a.m.	42_8	32 39.6	117 31.5	0	13.4				
1454	12:40 p.m.	41_8	32 42.4	117 26.6	0	13.9				
1455	1:00 p.m.	41_9	32 44.0	117 24.8	0	14.1				
1456	1:40 p.m.	40_9	32 47.3	117 21.0	0	13.8				
1457	2:00 p.m.	$(40)_{10}$	32 49.0	117 19.0	0	13.6				
1458	2:20 p.m.	(39_{10})	32 50.5	117 17.3	0	13.6				
				Feb. 18, 1910						
1459	1:00 p.m.	(39_{10})	32 51.1	117 17.1	0	13.8				
1460	1:20 p.m.	$(40)_{10}$	32 51.3	117 19.9	0	13.8				
1461	1:40 p.m.	$(40.5)_{10}$	32 51.5	117 22.5	0	13.9				
1462	2:20 p.m.	42_{10}	32 51.7	117 28.0	0	14.0				
1463	2:40 p.m.	42_{10}	32 51.9	117 30.6	0	14.2	2697	2564	2506	33.57
1464	3:00 p.m.	42_{10}	32 51.9	117 32.1	0	14.1	2689	2556	2499	33.47
1465	3:10 p.m.	42_{10}	32 52.0	117 32.0	365		2752	2616		34.25K
1466	3:21 p.m.	42_{10}	32 51.8	117 32.2	275		2744	2609		34.15K
1467	3:35 p.m.	42.5_{10}	32 51.6	117 32.5	185	9.0	2748	2612	2652	34.20K
1468	3:40 p.m.	42.5_{10}	32 51.6	117 32.5	0	14.2				
1469	3:48 p.m.	43_{10}	32 51.5	117 32.6	92	9.6	2728	2593	2622	33.95K?
1470	3:55 p.m.	43_{10}	32 51.4	117 32.8	46	11.7				K
1471	4:00 p.m.	43_{10}	32 51.3	117 33.0	18	13.6				K
1472	6:00 p.m.	42_{10}	32 51.2	117 31.5	0	13.8				
1473	6:40 p.m.	42_{10}	32 51.2	117 31.5	0	13.8	2687	2554	2505	33.44
1474	8:40 p.m.	42_{10}	32 51.0	117 29.6	0	13.4	2699	2566	2524	33.59
1475	8:58 p.m.	41_{10}	32 51.0	117 25.0	0	13.3				
1476	9:30 p.m.	$(40)_{10}$	32 51.2	117 17.8	0	13.5				
				Mar. 15, 1910						
1477	11:00 a.m.	$(39_{7.5})$	32 37.5	117 14.3	0	15.6				
1478	11:20 a.m.	40_8	32 38.0	117 18.2	0	15.7				
1479	11:40 a.m.	40_8	32 38.5	117 20.5	0	16.1				
1480	12:01 p.m.	41_8	32 39.0	117 22.9	0	16.0				
1481	12:25 p.m.	41_8	32 39.5	117 26.1	0	16.0				
1482	1:00 p.m.	42_8	32 40.4	117 30.3	0	15.7	2698	2565	2475	33.58
1483	1:23 p.m.	42_8	32 40.4	117 31.0	0	15.4	2696	2563	2477	33.55
1484	2:22 p.m.	42_8	32 40.4	117 31.0	0	15.8				
1485	2:58 p.m.	42_8	32 40.4	117 31.0	0	16.2				
1486	4:58 p.m.	42_8	32 40.4	117 31.0	0	15.6				
				Mar. 16, 1910						
1487	11:05 a.m.	$(39_{7.5})$	32 37.5	117 14.5	0	15.4				
1488	11:20 a.m.	(39_8)	32 37.6	117 15.8	0	15.6				
1489	11:40 a.m.	40_8	32 37.9	117 18.3	0	16.0				
1490	12:01 p.m.	40_8	32 38.3	117 20.4	0	16.2				
1491	12:20 p.m.	40.5_8	32 38.6	117 22.5	0	16.6				
1492	12:40 p.m.	41_8	32 38.8	117 24.7	0	15.8	2705	2572	2478	33.66
1493	1:00 p.m.	41_8	32 39.2	117 27.0	0	15.6	2702	2569	2481	33.63
1494	1:20 p.m.	42_8	32 39.6	117 27.6	0	15.5				
1495	2:42 p.m.	42_8	32 40.4	117 31.2	0	15.4				
				Mar. 17, 1910						
1496	9:00 a.m.	B	32 40.1	117 14.0	0	15.1				
1497	9:10 a.m.	(39_8)	32 38.6	117 14.2	0	15.1	2704	2571	2494	33.65
1498	9:30 a.m.	39_7	32 37.3	117 14.7	0	14.1				
1499	9:40 a.m.	39_7	32 36.6	117 15.5	0	14.8				
1500	9:50 a.m.	(39_8)	32 38.4	117 16.3	0	15.1				
1501	10:00 a.m.	(39_8)	32 39.0	117 16.5	0	15.0	2702	2569	2495	33.63
1502	10:40 a.m.	40_8	32 41.5	117 20.1	0	15.0				
1503	10:50 a.m.	40_8	32 42.3	117 21.0	0	15.1	2702	2569	2492	33.63
1504	11:10 a.m.	40.5_9	32 43.5	117 22.5	0	15.0				
1505	11:30 a.m.	41_9	32 45.1	117 24.5	0	14.8	2705	2572	2500	33.66
1506	11:45 a.m.	41_9	32 46.3	117 25.6	0	14.6				
1507	12:01 p.m.	41_{10}	32 47.0	117 26.8	0	14.8	2704	2571	2499	33.65
1508	12:30 p.m.	42_{10}	32 49.2	117 29.1	0	14.8				
1509	1:40 p.m.	42_{10}	32 50.2	117 29.7	0	14.7				
1510	2:40 p.m.	42_{10}	32 50.4	117 29.4	0	14.7				
1511	3:55 p.m.	42_{10}	32 50.6	117 29.2	0	14.7				

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0°/4°2	Specific gravity: 17°5/17°5	Specific gravity: t°/4°2	Salinity S ‰
				Mar. 17, 1910						
1512	4:55 p.m.	42_{13}	32° 50.6	117° 29.2	0	14.6	2700	2567	2500	33.60
1513	5:40 p.m.	42_{10}	32 50.6	117 29.2	0	14.6	2704	2571	2504	33.65
1514	6:30 p.m.	42_{10}	32 50.6	117 29.2	0	14.6	.....	.....	.....	.....
1515	7:06 p.m.	42_{10}	32 50.6	117 29.2	0	14.6	2704	2571	2504	33.65
				Apr. 18, 1910						
1516	4:20 p.m.	(39_8)	32 38.2	117 14.3	0	16.0	.....	.....	.....	.....
1517	4:40 p.m.	39_7	32 35.5	117 14.5	0	15.6	.....	.....	.....	.....
1518	5:00 p.m.	39_7	32 33.0	117 14.5	0	16.1	.....	.....	.....	.....
1519	5:20 p.m.	39_6	32 30.5	117 14.5	0	16.5	.....	.....	.....	.....
1520	5:40 p.m.	39_6	32 27.8	117 14.5	0	16.5	2711	2577	2469	33.74
1521	6:00 p.m.	39_5	32 25.5	117 14.6	0	17.0	.....	.....	.....	.....
				Apr. 19, 1910						
1522	8:35 a.m.	40_5	32 23.3	117 19.9	0	16.4	.....	.....	.....	.....
1523	10:15 a.m.	$40_{4.5}$	32 22.5	117 18.8	0	16.5	2711	2577	2469	33.74
1524	11:20 a.m.	40_4	32 21.7	117 17.6	0	16.7	2711	2577	2464	33.74
1525	11:30 a.m.	39_4	32 21.6	117 17.4	0	16.75	2711	2577	2461	33.74
1526	11:50 a.m.	39_4	32 22.3	117 15.2	0	16.4	.....	.....	.....	.....
1527	12:01 p.m.	39_5	32 24.2	117 14.4	0	16.7	.....	.....	.....	.....
				Apr. 20, 1910						
1528	1:30 a.m.	39_5	32 23.3	117 14.4	0	16.1	.....	.....	.....	.....
1529	1:40 a.m.	39_5	32 23.3	117 15.1	0	15.8	.....	.....	.....	.....
1530	1:50 a.m.	39_5	32 23.2	117 16.0	0	16.0	2708	2574	2477	33.70
1531	2:00 a.m.	39_5	32 23.2	117 17.0	0	16.0	2706	2573	2475	33.68
1532	2:10 a.m.	40_5	32 23.2	117 17.8	0	15.8	2711	2577	2485	33.74
1533	2:20 a.m.	40_5	32 23.2	117 18.7	0	15.7	.....	.....	.....	.....
1534	2:30 a.m.	40_5	32 23.2	117 19.7	0	16.1	2710	2576	2476	33.73
1535	6:00 a.m.	40_4	32 21.4	117 18.0	0	15.8	2708	2574	2481	33.70
				Apr. 21, 1910						
1536	4:50 a.m.	40_5	32 23.5	117 22.3	0	16.2	.....	.....	.....	.....
1537	6:20 a.m.	40_5	32 23.5	117 20.0	0	16.2	2708	2574	2472	33.70
1538	8:40 a.m.	40_5	32 24.5	117 19.7	0	16.7	2704	2571	2456	33.65
1539	9:00 a.m.	40_5	32 26.5	117 19.0	0	17.0	2709	2575	2455	33.71
1540	9:20 a.m.	40_6	32 28.5	117 18.3	0	17.05	.....	.....	.....	.....
1541	9:40 a.m.	39.5_6	32 30.6	117 17.5	0	17.0	.....	.....	.....	.....
1542	10:00 a.m.	39_7	32 32.6	117 16.6	0	16.6	.....	.....	.....	.....
1543	10:20 a.m.	39_7	32 34.8	117 15.8	0	17.5	2712	2578	2447	33.75
1544	10:40 a.m.	39_7	32 37.0	117 15.1	0	16.8	.....	.....	.....	.....
1545	11:00 a.m.	(39_8)	32 39.0	117 14.5	0	15.3	2707	2574	2491	33.69
				July 16, 1910						
1546	5:35 a.m.	B	32 41.1	117 13.85	0	17.85	2746	2610	2470	34.17
1547	5:45 a.m.	B	32 37.2	117 14.5	0	17.6	2747	2611	2479	34.19
1548	6:05 a.m.	(39_8)	32 37.6	117 16.8	0	16.1	2727	2592	2493	33.94
1549	6:23 a.m.	40_8	32 38.0	117 19.2	0	16.4	2717	2583	2477	33.81
1550	6:40 a.m.	40_8	32 38.4	117 21.5	0	15.2	2725	2590	2511	33.91?
1551	7:00 a.m.	41_8	32 38.9	117 23.8	0	18.9	2713	2579	2412	33.76
1552	7:20 a.m.	41_8	32 39.4	117 26.2	0	19.7	2711	2577	2391	33.74
1553	7:40 a.m.	42_8	32 39.8	117 28.5	0	19.8	2708	2574	2384	33.70
1554	8:00 a.m.	42_8	32 40.2	117 30.8	0	19.9	.....	.....	.....	.....
1555	8:20 a.m.	43_8	32 40.7	117 32.8	0	19.6	2720	2586	2401	33.85
1556	9:45 a.m.	43_8	32 40.7	117 32.8	100	9.55	.....	.....	.....	.....
1557	10:25 a.m.	43_8	32 40.7	117 32.8	50	10.8?	2705	2572	2578	33.66
1558	12:45 p.m.	43_8	32 40.7	117 32.8	0	19.8	2715	2581	2391	33.79
1559	12:45 p.m.	43_8	32 40.7	117 32.8	50	11.08	2691	2558	2560	33.49
1560	12:45 p.m.	43_8	32 40.7	117 32.8	125	9.44	2745	2610	2642	34.16?
1561	1:55 p.m.	43_8	32 40.7	117 32.8	220	9.34	2757	2621	2655	34.31
1562	2:20 p.m.	43_8	32 40.7	117 32.8	0	19.95	2717	2583	2389	33.81
1563	2:20 p.m.	43_8	32 40.7	117 32.8	25	14.47	2703	2570	2506	33.64
1564	2:20 p.m.	43_8	32 40.7	117 32.8	50	11.44	2684	2552	2548	33.40
1565	2:20 p.m.	43_8	32 40.7	117 32.8	75	10.24	2712	2578	2597	33.75
1566	2:20 p.m.	43_8	32 40.7	117 32.8	125	9.55	2707	2574	2603	33.69?
				Aug. 13, 1910						
1567	11:20 a.m.	40_7	32 23.4	117 18.2	0	19.75	2705	2572	2383	33.66
1568	12:10 p.m.	40_7	32 23.4	117 18.2	0	19.8	.....	.....	.....	.....
1569	1:00 p.m.	40_7	32 23.4	117 18.2	0	20.1	.....	.....	.....	.....
1570	1:25 p.m.	40_7	32 23.4	117 18.2	0	20.1	2706	2573	2374	33.68

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position		Depth in meters	Temperature in centigrade	Specific gravity			Salinity S‰
			North latitude	West longitude			$S\frac{0°}{4°}$	$S\frac{17.5}{17.5}$	$S\frac{t°}{4°}$	
				Aug. 13, 1910						
1571	5:05 p.m.	40_5	32° 23.4	117° 21.9	0	20.3	2709	2575	2373	33.71
1572	5:40 p.m.	40_5	32 23.4	117 21.9	0	20.2	2710	2576	2376	33.73
1573	7:00 p.m.	40_5	32 23.4	117 21.9	0	20.1	2709	2575	2377	33.71
				Aug. 14, 1910						
1574	8:12 a.m.	40_5	32 23.4	117 18.2	0	19.0	2708	2574	2405	33.70
1575	8:12 a.m.	40_5	32 23.4	117 18.2	25	13.26	2697	2564	2524	33.57
1576	8:42 a.m.	40_5	32 23.4	117 18.2	0	19.0	.....			
1577	9:14 a.m.	40_5	32 23.4	117 18.2	0	19.1	2708	2574	2403	33.70
1578	9:14 a.m.	40_5	32 23.4	117 18.2	150	9.67	2737	2602	2629	34.06
1579	10:30 a.m.	40_5	32 23.4	117 21.9	0	19.6	2706	2573	2388	33.68
1580	10:35 a.m.	40_5	32 23.4	117 21.9	550	6.77	....	....		
1581	10:35 a.m.	40_5	32 23.4	117 21.9	20	14.58	2686	2553	2488	33.43
1582	11:05 a.m.	40_5	32 23.4	117 21.9	0	19.7	2707	2578	2386	33.69
1583	11:05 a.m.	40_5	32 23.4	117 21.9	200	9.60	2749	2613	2644	34.21
1584	11:05 a.m.	40_5	32 23.4	117 21.9	75	10.59	2703	2570	2581	33.64
1585	11:05 a.m.	40_5	32 23.4	117 21.9	30	13.26	....			
1586	1:50 p.m.	40_5	32 23.4	117 21.9	0	20.4	2710	2576	2371	33.73
1587	3:30 p.m.	41_5	32 23.4	117 24.2	800	5.24	..	....	..	....
1588	3:30 p.m.	41_5	32 23.4	117 24.2	350	8.32	..	....	..	..
1589	3:30 p.m.	41_5	32 23.4	117 24.2	125	10.35	...	....	..	...
1590	3:30 p.m.	41_5	32 23.4	117 24.2	50	11.66	2687	2554	2546	33.44
1591	3:30 p.m.	41_5	32 23.4	117 24.2	20	14.66	2682	2550	2481	33.38
1592	4:20 p.m.	41_5	32 23.4	117 24.2	500	6.66	....	....	....	....
1593	4:20 p.m.	41_5	32 23.4	117 24.2	75	10.70	2698	2565	2573	33.58
1594	4:20 p.m.	41_5	32 23.4	117 24.2	30	13.40	2682	2550	2507	33.38
1595	4:20 p.m.	41_5	32 23.4	117 24.2	10	20.26	2703	2570	2369	33.64
1596	5:00 p.m.	41_5	32 23.4	117 24.2	0	20.8	2710	2576	2360	33.73
1597	6:05 p.m.	41_5	32 23.4	117 24.2	125	10.18	.....	....	..	....
1598	6:05 p.m.	41_5	32 23.4	117 24.2	20	14.82	....	....	....	....
				Aug. 15, 1910						
1599	1:40 p.m.	40_{11}	32 52.8	117 19.0	0	19.95	2711	2577	2384	33.74
1600	2:44 p.m.	40_{11}	32 52.8	117 19.0	200	9.29	2732	2597	2631	34.00?
1601	2:44 p.m.	40_{11}	32 52.8	117 19.0	125	9.63	2721	2587	2614	33.86
1602	2:44 p.m.	40_{11}	32 52.8	117 19.0	75	9.82	2730	2595	2620	33.98?
1603	2:44 p.m.	40_{11}	32 52.8	117 19.0	50	10.15	2710	2576	2595	33.73
1604	2:44 p.m.	40_{11}	32 52.8	117 19.0	25	11.51	2699	2566	2561	33.59
1605	3:05 p.m.	40_{11}	32 52.8	117 19.0	0	19.4	2716	2582	2402	33.80
				Aug. 16, 1910						
1606	10:15 a.m.	41_5	32 23.4	117 24.2	0	20.6	2709	2575	2364	33.71
1607	2:00 p.m.	41_5	32 23.4	117 24.2	800	6.32	.....	....	....	
1608	2:00 p.m.	41_5	32 23.4	117 24.2	350	8.32	.....	....	....	
1609	2:15 p.m.	41_5	32 23.4	117 24.2	125	9.73	2717	2583	2609	33.81
1610	2:15 p.m.	41_5	32 23.4	117 24.2	50	11.25	2693	2560	2559	33.52
1611	2:15 p.m.	41_5	32 23.4	117 24.2	20	14.46	2690	2557	2494	33.48
1612	2:45 p.m.	41_5	32 23.4	117 24.2	0	21.0	2704	2571	2348	33.65
1613	5:06 p.m.	41_5	32 23.4	117 24.2	500	7.28	....	.....		....
1614	5:06 p.m.	41_5	32 23.4	117 24.2	225	9.26	2737	2602	2637	34.06
1615	5:06 p.m.	41_5	32 23.4	117 24.2	75	10.24	2709	2575	2592	33.71
1616	5:06 p.m.	41_5	32 23.4	117 24.2	30	12.20	2686	2553	2534	33.43
1617	5:06 p.m.	41_5	32 23.4	117 24.2	10	19.58	2709	2575	2391	33.71
1618	5:22 p.m.	41_5	32 23.4	117 24.2	0	20.55	2708	2574	2364	33.70
1619	6:15 p.m.	41_5	32 23.4	117 24.2	0	20.45	2709	2575	2367	33.71
1620	6:57 p.m.	41_5	32 23.4	117 24.2	0	20.3	2710	2576	2373	33.73
1621	8:07 p.m.	40_5	32 23.4	117 21.9	0	20.3	2706	2573	2368	33.68
1622	8:35 p.m.	40_5	32 23.4	117 21.9	0	20.1	2712	2578	2379	33.75
				Aug. 17, 1910						
1623	10:50 a.m.	40_5	32 23.4	117 18.2	20	14.03	2679	2547	2492	33.34
1624	10:50 a.m.	40_5	32 23.4	117 18.2	15	14.66	2685	2552	2486	33.42
1625	10:50 a.m.	40_5	32 23.4	117 18.2	10	17.45	2694	2561	2492	33.53
1626	10:50 a.m.	40_5	32 23.4	117 18.2	5	20.50	2706	2573	2364	33.68
1627	10:50 a.m.	40_5	32 23.4	117 18.2	0	20.25	2710	2576	2375	33.73
1628	11:18 a.m.	40_5	32 23.4	117 18.2	150	9.75	2732	2597	2639	34.00
1629	11:18 a.m.	40_5	32 23.4	117 18.2	75	10.94	2703	2570	2575	33.64
1630	11:18 a.m.	40_5	32 23.4	117 18.2	20	13.79	....	....		....
1631	11:18 a.m.	40_5	32 23.4	117 18.2	5	20.31	2705	2572	2367	33.66

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position		Depth in meters	Temperature in centigrade	Specific gravity			Salinity S‰
			North latitude	West longitude			$S\frac{0°}{4°0}$	$S\frac{17°5}{17°5}$	$S\frac{t°}{4°0}$	
				Aug. 17, 1910						
1632	12:05 p.m.	40_5	39° 23.4	117° 18.2	0	20°3	2709	2575	2372	33.71
1633	12:36 p.m.	40_5	32 23.4	117 18.2	150	9.81	2724	2589	2615	33.90
1634	12:36 p.m.	40_5	32 23.4	117 18.2	100	10.60	.....	.....	.....	.....
1635	12:36 p.m.	40_5	32 23.4	117 18.2	75	10.46	2708	2574	2588	33.70
1636	12:36 p.m.	40_5	32 23.4	117 18.2	50	11.53	2692	2559	2554	33.50
1637	12:36 p.m.	40_5	32 23.4	117 18.2	25	13.25	2680	2548	2508	33.35
1638	1:30 p.m.	40_5	32 23.4	117 21.9	0	20.4	2707	2574	2367	33.69
1639	1:32 p.m.	40_5	32 23.4	117 21.9	25	13.69	2694	2561	2513	33.53
1640	1:32 p.m.	40_5	32 23.4	117 21.9	20	15.05	2692	2559	2485	33.50
1641	1:32 p.m.	40_5	32 23.4	117 21.9	15	16.11	2699	2566	2466	33.59
1642	1:32 p.m.	40_5	32 23.4	117 21.9	10	19.20	2696	2563	2388	33.55
1643	1:32 p.m.	40_5	32 23.4	117 21.9	5	20.36	2703	2570	2365	33.64
1644	1:48 p.m.	40_5	32 23.4	117 21.9	125	9.71	2722	2588	2615	33.88
1645	1:48 p.m.	40_5	32 23.4	117 21.9	75	10.21	2710	2576	2594	33.73
1646	1:48 p.m.	40_5	32 23.4	117 21.9	50	11.22	2699	2566	2565	33.59
1647	1:48 p.m.	40_5	32 23.4	117 21.9	30	12.76	2694	2561	2531	33.53
1648	2:55 p.m.	40_5	32 23.4	117 21.9	550	.. ..	2766	2630	.....	34.42
1649	2:55 p.m.	40_5	32 23.4	117 21.9	150	. .....	2752	2616	.....	34.25?
1650	4:30 p.m.	40_5	32 23.4	117 21.9	0	20.2	2703	2570	2369	33.64
1651	5:20 p.m.	40_5	32 23.4	117 21.9	550	7.93	.....	.....	.....	.....
1652	5:20 p.m.	40_5	32 23.4	117 21.9	200	8.56	.....	.....	.....	.....
1653	5:20 p.m.	40_5	32 23.4	117 21.9	150	8.95	.....	.....	.....	.....
1654	5:20 p.m.	40_5	32 23.4	117 21.9	100	9.76	2721	2587	2613	33.86
1655	6:15 p.m.	41_5	32 23.4	117 24.2	0	20.15	2706	2573	2373	33.68
1656	7:03 p.m.	41_5	32 23.4	117 24.2	0	20.1	2706	2573	2375	33.68
1657	7:33 p.m.	41_5	32 23.4	117 24.2	0	20.0	2703	2570	2374	33.64
1658	8:05 p.m.	41_5	32 23.4	117 24.2	0	20.0	2703	2570	2374	33.64
1659	9:05 p.m.	40_5	32 23.4	117 21.9	0	19.9	2707	2574	2381	33.69
1660	9:40 p.m.	40_5	32 23.4	117 21.9	0	20.0	.....	.....	.....	.....
				Aug. 18, 1910						
1661	7:40 a.m.	39_5	32 23.3	117 14.5	25	12.94	.....	.....	.....	.....
1662	7:40 a.m.	39_5	32 23.3	117 14.5	20	12.81	.....	.....	.....	.....
1663	7:40 a.m.	39_5	32 23.3	117 14.5	15	15.91	.....	.....	.....	.....
1664	7:40 a.m.	39_5	32 23.3	117 14.5	10	18.63	.....	.....	.....	.....
1665	7:40 a.m.	39_5	32 23.3	117 14.5	5	19.30	.....	.....	.....	.....
1666	7:40 a.m.	39_5	32 23.3	117 14.5	0	19.30	.....	.....	.....	.....
1667	7:55 a.m.	39_5	32 23.3	117 15.2	25	12.92	.....	.....	.....	.....
1668	7:55 a.m.	39_5	32 23.3	117 15.2	20	13.30	.....	.....	.....	.....
1669	7:55 a.m.	39_5	32 23.3	117 15.2	15	13.90	... ...	.....	.....	.....
1670	7:55 a.m.	39_5	32 23.3	117 15.2	10	16.42	.....	... .	.....	.....
1671	7:55 a.m.	39_5	32 23.3	117 15.2	5	19.04	.....	.....	.....	.....
1672	7:55 a.m.	39_5	32 23.3	117 15.2	0	18.90	.....	.....	.....	.....
1673	8:10 a.m.	39_5	32 23.35	117 15.8	25	13.18	.. ....	.....	.....	.....
1674	8:10 a.m.	39_5	32 23.35	117 15.8	20	13.20	... .	... .	.....	.....
1675	8:10 a.m.	39_5	32 23.35	117 15.8	15	15.74	.....	.....	.....	.....
1676	8:10 a.m.	39_5	32 23.35	117 15.8	10	18.54	.. ....	... .	.....	.....
1677	8:10 a.m.	39_5	32 23.35	117 15.8	5	18.58	.....	.....	.....	.....
1678	8:10 a.m.	39_5	32 23.35	117 15.8	0	18.60	.....	.. ....	.....	.....
1679	8:25 a.m.	39_5	32 23.35	117 16.6	25	12.83	.....	.....	.....	.....
1680	8:25 a.m.	39_5	32 23.35	117 16.6	20	13.69	.....	.....	.....	.....
1681	8:25 a.m.	39_5	32 23.35	117 16.6	15	15.46	.....	... .	.....	.....
1682	8:25 a.m.	39_5	32 23.35	117 16.6	10	16.50	.....	.....	.....	.....
1683	8:25 a.m.	39_5	32 23.35	117 16.6	5	19.71	.....	.....	.....	.....
1684	8:25 a.m.	39_5	32 23.35	117 16.6	0	19.71	.....	.....	.....	.....
1685	8:40 a.m.	39_5	32 23.35	117 17.2	25	13.25	.....	.....	.....	.....
1686	8:40 a.m.	39_5	32 23.35	117 17.2	20	15.29	.....	.....	.....	.....
1687	8:40 a.m.	39_5	32 23.35	117 17.2	15	16.17	.....	.....	.....	.....
1688	8:40 a.m.	39_5	32 23.35	117 17.2	10	16.80	.....	.....	.....	.....
1689	8:40 a.m.	39_5	32 23.35	117 17.2	5	19.73	.....	.....	.....	.....
1690	8:40 a.m.	39_5	32 23.35	117 17.2	0	19.75	.....	.....	.....	.....
1691	8:53 a.m.	40_5	32 23.4	117 17.8	25	13.10	.....	.....	.....	.....
1692	8:53 a.m.	40_5	32 23.4	117 17.8	20	14.46	.. ....	.....	.....	.....
1693	8:53 a.m.	40_5	32 23.4	117 17.8	15	15.83	.....	.....	.....	.....
1694	8:53 a.m.	40_5	32 23.4	117 17.8	10	19.12	.....	.....	.....	.....

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: $S\frac{0°}{4°0}$	Specific gravity: $S\frac{17°5}{17°5}$	Specific gravity: $S\frac{t°}{4°0}$	Salinity $S^{0}/_{00}$
			Aug. 18, 1910							
1695	8:53 a.m.	40,	32° 23.4	117° 17.8	5	19.79	.....	.....	.....	.....
1696	8:53 a.m.	40,	32 23.4	117 17.8	0	19.8	.....	.....	.....	.....
1697	9:25 a.m.	40,	32 23.4	117 20.0	25	13.98	.....	.....	.....	.....
1698	9:25 a.m.	40,	32 23.4	117 20.0	20	15.23	.....	.....	.....	.....
1699	9:25 a.m.	40,	32 23.4	117 20.0	15	17.05	.....	.....	.....	.....
1700	9:25 a.m.	40,	32 23.4	117 20.0	10	19.78	.....	.....	.....	.....
1701	9:25 a.m.	40,	32 23.4	117 20.0	0	19.8	.....	.....	.....	.....
1702	9:45 a.m.	40,	32 24.55	117 20.0	25	13.13	.....	.....	.....	.....
1703	9:45 a.m.	40,	32 24.55	117 20.0	20	14.79	.....	.....	.....	.....
1704	9:45 a.m.	40,	32 24.55	117 20.0	15	15.54	.....	.....	.....	.....
1705	9:45 a.m.	40,	32 24.55	117 20.0	10	19.74	.....	.....	.....	.....
1706	9:45 a.m.	40,	32 24.55	117 20.0	0	19.85	.....	.....	.....	.....
1707	10:05 a.m.	40,	32 24.4	117 17.6	25	12.95	.....	.....	.....	.....
1708	10:05 a.m.	40,	32 24.4	117 17.6	20	15.05	.....	.....	.....	.....
1709	10:05 a.m.	40,	32 24.4	117 17.6	15	15.44	.....	.....	.....	.....
1710	10:05 a.m.	40,	32 24.4	117 17.6	10	17.97	.....	.....	.....	.....
1711	10:05 a.m.	40,	32 24.4	117 17.6	0	19.5	.....	.....	.....	.....
1712	10:27 a.m.	39,	32 24.35	117 15.35	25	13.40	.....	.....	.....	.....
1713	10:27 a.m.	39,	32 24.35	117 15.35	20	14.16	.....	.....	.....	.....
1714	10:27 a.m.	39,	32 24.35	117 15.35	15	14.98	.....	.....	.....	.....
1715	10:27 a.m.	39,	32 24.35	117 15.35	10	15.84	.....	.....	.....	.....
1716	10:27 a.m.	39,	32 24.35	117 15.35	0	18.9	.....	.....	.....	.....
1717	10:55 a.m.	39,	32 25.0	117 16.3	25	13.97	.....	.....	.....	.....
1718	10:55 a.m.	39,	32 25.0	117 16.3	20	14.82	.....	.....	.....	.....
1719	10:55 a.m.	39,	32 25.0	117 16.3	15	15.50	.....	.....	.....	.....
1720	10:55 a.m.	39,	32 25.0	117 16.3	10	16.62	.....	.....	.....	.....
1721	10:55 a.m.	39,	32 25.0	117 16.3	0	19.7	.....	.....	.....	.....
1722	12:40 p.m.	39,	32 35.1	117 14.8	25	11.68	.....	.....	.....	.....
1723	12:40 p.m.	39,	32 35.1	117 14.8	20	12.03	.....	.....	.....	.....
1724	12:40 p.m.	39,	32 35.1	117 14.8	15	12.58	.....	.....	.....	.....
1725	12:40 p.m.	39,	32 35.1	117 14.8	10	13.70	.....	.....	.....	.....
1726	12:40 p.m.	39,	32 35.1	117 14.8	0	18.6	.....	.....	.....	.....
			June 14, 1911							
1727	2:40 a.m.	40,	32 22.4	117 21.2	64	9.65	.....	.....	.....	.....
1728	3:25 a.m.	40,	From 2:14 to 5:15 a.m.		0	17.0	2714	2580	2459	33.78
1729	3:30 a.m.	40,	the boat drifted		110	9.40	.....	.....	.....	.....
1730	3:30 a.m.	40,	from the above		73	.....	2705	2572	.....	33.66
1731	3:30 a.m.	40,	position to the		46	12.55	2695	2562	2536	33.54
1732	3:30 a.m.	40,	following position		27	14.20	.....	.....	.....	.....
1733	5:15 a.m.	40,	32 22.2	117 21.6	0	16.9	2708	2574	2455	33.70
1734	6:05 a.m.	40,	32 22.4	117 21.2	0	16.8	2709	2575	2458	33.71
1735	8:20 a.m.	40,	32 22.4	117 21.2	137	9.40	2742	2606	2639	34.12
1736	8:20 a.m.	40,	32 22.4	117 21.2	92	.....	2722	2588	.....	33.88
1737	8:20 a.m.	40,	32 22.4	117 21.2	13	16.65	2704	2571	2458	33.65
1738	8:20 a.m.	40,	32 22.4	117 21.2	7	16.70	.....	.....	.....	.....
1739	8:40 a.m.	40,	32 22.4	117 21.2	110	9.50	.....	.....	.....	.....
1740	8:40 a.m.	40,	32 22.4	117 21.2	73	.....	2706	2573	.....	33.68
1741	8:40 a.m.	40,	32 22.4	117 21.2	46	11.00	.....	.....	.....	.....
1742	8:40 a.m.	40,	32 22.4	117 21.2	27	13.40	.....	.....	.....	.....
1743	9:05 a.m.	40,	32 22.4	117 21.2	64	9.75	2706	2573	2598	33.68
1744	9:05 a.m.	40,	32 22.4	117 21.2	4	17.05	2703	2570	2448	33.64
1745	9:20 a.m.	40,	32 22.4	117 21.2	46	11.25	2689	2556	2556	33.47
1746	9:20 a.m.	40,	32 22.4	117 21.2	37	.....	2693	2560	.....	33.52
1747	9:20 a.m.	40,	32 22.4	117 21.2	16	15.80	2697	2564	2470	33.57
1748	9:35 a.m.	40,	32 22.4	117 21.2	82	9.40	2712	2578	2610	33.75
1749	9:35 a.m.	40,	32 22.4	117 21.2	11	16.60	.....	.....	.....	.....
1750	9:35 a.m.	40,	32 22.4	117 21.2	6	16.85	2700	2567	2450	33.60
1751	10:00 a.m.	40,	32 22.4	117 21.2	0	17.0	2717	2583	2462	33.81
1752	10:00 a.m.	40,	From 10:00 to 11:59		137	9.45	2729	2594	2625	33.96
1753	10:00 a.m.	40,	a.m. the boat		92	9.60	2707	2574	2601	33.69
1754	10:00 a.m.	40,	drifted from the		13	16.90	2699	2566	2448	33.59
1755	10:15 a.m.	40,	above position		110	9.60	.....	.....	.....	.....
1756	10:15 a.m.	40,	to the following		73	10.20	2700	2567	2585	33.60
1757	10:15 a.m.	40,	position		27	13.40	2690	2557	2515	33.48

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° S 4°0	Specific gravity: 17°5 S 17°5	Specific gravity: t° S 4°0	Salinity S ‰
				June 14, 1911						
1758	10:30 a.m.	40_4			7	17°05	.....	.....	.....	.....
1759	10:40 a.m.	40_4			82	9.10	.....	.....	.....	.....
1760	10:40 a.m.	40_4			55	11.35	.....	.....	.....	.....
1761	11:00 a.m.	40_4			0	17.0	2714	2580	2459	33.78
1762	11:59 a.m.	40_4	32° 22'0	117° 20'4	0	17.01	2720	2586	2465	33.85
				June 15, 1911						
1763	1:30 a.m.	40_5	32 22.7	117 19.2	0	16.07	2718	2584	2485	33.83
1764	1:30 a.m.	40_5	From 1:30 to 4:10		137	9.40	2731	2596	2628	33.99
1765	1:30 a.m.	40_5	a.m. the boat		92	9.6	.....	.....	.....	.....
1766	1:30 a.m.	40_5	drifted from the		13	16.55	2725	2590	2479	33.91
1767	1:30 a.m.	40_5	above position		7	16.75	2699	2566	2450	33.59
1768	2:00 a.m.	40_5	to the following		110	9.70	2712	2578	2604	33.75
1769	2:00 a.m.	40_5	position		73	.....	2703	2570	.....	33.64
1770	2:00 a.m.	40_5			46	11.20	2691	2558	2559	33.49
1771	2:00 a.m.	40_5			27	13.15	2696	2563	2526	33.55
1772	2:23 a.m.	40_5			0	16.5	2707	2574	2464	33.69
1773	3:20 a.m.	40_5			82	9.70	.....	.....	.....	.....
1774	3:20 a.m.	40_5			22	.....	2702	2569	.....	33.63
1775	3:20 a.m.	40_5			18	.....	2700	2576	.....	33.60
1776	3:22 a.m.	40_5			0	16.5	.....	.....	.....	.....
1777	3:25 a.m.	40_5			46	10.65	.....	.....	.....	.....
1778	3:25 a.m.	40_5			37	11.10	.....	.....	.....	.....
1779	3:25 a.m.	40_5			16	15.15	2700	2567	2488	33.60
1780	3:25 a.m.	40_5			9	16.15	2699	2566	2466	33.59
1781	3:55 a.m.	40_5			64	9.80	2709	2575	2600	33.71
1782	3:55 a.m.	40_5			37	11.20	2690	2557	2558	33.48
1783	3:55 a.m.	40_5			11	15.95	2700	2567	2470	33.60
1784	3:55 a.m.	40_5	32 23.6	117 18.5	6	16.55	2717	2583	2473	33.81
1785	4:23 a.m.	40_5	32 22.7	117 19.2	0	16.7	2715	2581	2468	33.79
1786	4:23 a.m.	40_5	From 4:20 to 6:25		137	9.40	.....	.....	.....	.....
1787	4:23 a.m.	40_5	a.m. the boat		92	9.60	.....	.....	.....	.....
1788	4:23 a.m.	40_5	drifted from the		13	16.00	2697	2564	2466	33.56
1789	4:23 a.m.	40_5	above position		7	16.65	2697	2564	2451	33.56
1790	4:40 a.m.	40_5	to the following		110	9.50	.....	.....	.....	.....
1791	4:40 a.m.	40_5	position		73	9.55	2713	2579	2608	33.76
1792	4:40 a.m.	40_5			46	10.50	2699	2566	2578	33.59
1793	4:40 a.m.	40_5			27	12.80	2687	2554	2525	33.44
1794	5:07 a.m.	40_5			0	16.6	.....	.....	.....	.....
1795	5:50 a.m.	40_5			82	9.40	2713	2579	2611	33.76
1796	5:50 a.m.	40_5			55	10.72	2694	2561	2570	33.53
1797	5:50 a.m.	40_5			22	15.00	.....	.....	.....	.....
1798	5:50 a.m.	40_5			18	15.60	.....	.....	.....	.....
1799	6:00 a.m.	40_5			92	9.50	2730	2595	2626	33.97
1800	6:00 a.m.	40_5			46	10.32	2697	2564	2580	33.57
1801	6:00 a.m.	40_5			16	15.80	.....	.....	.....	.....
1802	6:00 a.m.	40_5			9	16.45	2697	2564	2455	33.57
1803	6:15 a.m.	40_5			64	9.75	2723	2588	2615	33.89
1804	6:15 a.m.	40_5			37	12.20	2687	2554	2536	33.44
1805	6:15 a.m.	40_5			11	16.60	2697	2564	2452	33.57
1806	6:15 a.m.	40_5			6	16.70	2701	2568	2451	33.61
1807	6:25 a.m.	40_5	32 23.5	117 18.9	0	16.5	.....	.....	.....	.....
1808	7:05 a.m.	40_5	32 22.7	117 19.2	0	16.8	2710	2576	2460	33.73
1809	7:35 a.m.	40_5	From 7:05 to 9:25		137	9.40	2733	2598	2630	34.01
1810	7:35 a.m.	40_5	a.m. the boat		92	9.50	2731	2596	2626	33.99
1811	7:35 a.m.	40_5	drifted from the		13	16.80	2702	2569	2453	33.63
1812	7:45 a.m.	40_5	above position		110	9.50	2733	2598	2629	34.01
1813	7:45 a.m.	40_5	to the following		73	9.65	2706	2573	2599	33.68
1814	7:45 a.m.	40_5	position		27	13.10	2695	2562	2527	33.54
1815	7:55 a.m.	40_5			55	10.70	.....	.....	.....	.....
1816	7:55 a.m.	40_5			7	16.85	.....	.....	.....	.....
1817	8:05 a.m.	40_5			0	16.8	2710	2576	2460	33.73
1818	8:20 a.m.	40_5			0	16.7	2705	2572	2457	33.66
1819	9:05 a.m.	40_5			18	15.95	2697	2564	2467	33.57
1820	9:05 a.m.	40_5			6	16.75	2697	2564	2449	33.57

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position		Depth in meters	Temperature in centigrade	Specific gravity			Salinity S ‰
			North latitude	West longitude			0° S / 4°0	17°5 S / 17°5	t° S / 4°0	
				June 15, 1911						
1821	9:12 a.m.	40.			82	9.50	.....	.....	.....	.....
1822	9:12 a.m.	40.			64	10.25	2702	2569	2585	33.63
1823	9:12 a.m.	40.			11	16.65	2706	2573	2461	33.68
1824	9:20 a.m.	40.			37	12.40	2690	2557	2534	33.48
1825	9:20 a.m.	40.			16	16.45	2695	2562	2453	33.54
1826	9:20 a.m.	40.			9	16.65	2696	2563	2450	33.55
1827	9:25 a.m.	40.	32° 23'2	117° 18'6	0	16.7	2703	2570	2456	33.64
1828	9:55 a.m.	39.	32 23.2	117 17.4	17	15.70	.....	.....	.....	.....
1829	9:55 a.m.	39.	32 23.2	117 17.4	11	16.55	.....	.....	.....	.....
1830	9:55 a.m.	39.	32 23.2	117 17.4	5	16.65	.....	.....	.....	.....
1831	9:55 a.m.	39.	32 23.2	117 17.4	0	16.7	.....	.....	.....	.....
1832	9:55 a.m.	39.	32 23.2	117 17.4	20	14.40	.....	.....	.....	.....
1833	9:55 a.m.	39.	32 23.2	117 17.4	12	15.65	.....	.....	.....	.....
1834	9:55 a.m.	39.	32 23.2	117 17.4	8	16.45	.....	.....	.....	.....
1835	10:20 a.m.	39.	32 23.2	117 16.2	17	14.90	.....	.....	.....	.....
1836	10:20 a.m.	39.	32 23.2	117 16.2	11	15.70	.....	.....	.....	.....
1837	10:20 a.m.	39.	32 23.2	117 16.2	5	16.65	.....	.....	.....	.....
1838	10:20 a.m.	39.	32 23.2	117 16.2	0	16.6	.....	.....	.....	.....
1839	10:20 a.m.	39.	32 23.2	117 16.2	20	14.50	.....	.....	.....	.....
1840	10:20 a.m.	39.	32 23.2	117 16.2	12	15.65	.....	.....	.....	.....
1841	10:20 a.m.	39.	32 23.2	117 16.2	8	16.40	.....	.....	.....	.....
1842	10:45 a.m.	39.	32 23.3	117 15.5	17	14.90	.....	.....	.....	.....
1843	10:45 a.m.	39.	32 23.3	117 15.5	11	16.40	.....	.....	.....	.....
1844	10:45 a.m.	39.	32 23.3	117 15.5	5	16.70	.....	.....	.....	.....
1845	10:45 a.m.	39.	32 23.3	117 15.5	0	16.9	.....	.....	.....	.....
1846	10:45 a.m.	39.	32 23.3	117 15.5	20	14.40	.....	.....	.....	.....
1847	10:45 a.m.	39.	32 23.3	117 15.5	12	16.75	.....	.....	.....	.....
1848	10:45 a.m.	39.	32 23.3	117 15.5	8	16.50	.....	.....	.....	.....
1849	11:05 a.m.	39.	32 23.3	117 14.9	17	16.30	.....	.....	.....	.....
1850	11:05 a.m.	39.	32 23.3	117 14.9	11	16.65	.....	.....	.....	.....
1851	11:05 a.m.	39.	32 23.3	117 14.9	5	16.75	.....	.....	.....	.....
1852	11:05 a.m.	39.	32 23.3	117 14.9	0	16.9	.....	.....	.....	.....
1853	11:05 a.m.	39.	32 23.3	117 14.9	20	16.40	.....	.....	.....	.....
1854	11:05 a.m.	39.	32 23.3	117 14.9	12	16.65	.....	.....	.....	.....
1855	11:05 a.m.	39.	32 23.3	117 14.9	8	16.75	.....	.....	.....	.....
1856	11:25 a.m.	39.	32 23.1	117 14.1	17	15.95	.....	.....	.....	.....
1857	11:25 a.m.	39.	32 23.1	117 14.1	11	15.40	.....	.....	.....	.....
1858	11:25 a.m.	39.	32 23.1	117 14.1	5	16.60	.....	.....	.....	.....
1859	11:25 a.m.	39.	32 23.1	117 14.1	0	16.8	.....	.....	.....	.....
1860	11:25 a.m.	39.	32 23.1	117 14.1	20	13.00	.....	.....	.....	.....
1861	11:25 a.m.	39.	32 23.1	117 14.1	12	15.50	.....	.....	.....	.....
1862	11:25 a.m.	39.	32 23.1	117 14.1	8	16.70	.....	.....	.....	.....
				June 16, 1911						
1863	1:53 a.m.	40.	32 23.5	117 18.0	0	16.9	2713	2579	2460	33.76
1864	1:53 a.m.	40.	From 1:48 to 3.45		137	9.50	2728	2593	2623	33.95
1865	1:53 a.m.	40.	a.m. the boat		92	9.75	2712	2578	2604	33.75
1866	1:53 a.m.	40.	drifted from the		13	16.55	2700	2567	2456	33.60
1867	2:04 a.m.	40.	above position		110	.....	2714	2580	.....	33.78
1869	2:04 a.m.	40.	to the following		27	13.20	2686	2553	2515	33.43
1870	2:15 a.m.	40.	position		82	.....	2698	2565	.....	33.58
1871	2:15 a.m.	40.			55	10.95	.....	.....	.....	.....
1872	2:15 a.m.	40.			7	16.65	2707	2574	2460	33.69
1873	2:30 a.m.	40.			0	16.6	2705	2572	2460	33.66
1874	2:45 a.m.	40.			0	16.7	2704	2571	2457	33.65
1875	3:25 a.m.	39.			0	16.8	2712	2578	2462	33.75
1876	3:25 a.m.	39.			46	11.20	2693	2560	2561	33.52
1877	3:25 a.m.	39.			18	15.40	2694	2561	2477	33.53
1878	3:25 a.m.	39.			6	16.80	.....	.....	.....	.....
1879	3:35 a.m.	39.			82	9.80	2716	2582	2607	33.80
1880	3:35 a.m.	39.			64	10.40	2700	2567	2581	33.60
1881	3:35 a.m.	39.			11	16.60	2700	2567	2454	33.60
1882	3:40 a.m.	39.			37	12.00	2688	2555	2541	33.45
1883	3:40 a.m.	39.			16	15.95	.....	.....	.....	.....
1884	3:40 a.m.	39.			9	16.70	2705	2572	2457	33.66

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position North latitude	Position West longitude	Depth in meters	Temperature in centigrade	Specific gravity 0°/4°0 S	Specific gravity 17°5/17°5 S	Specific gravity t°/4°0 S	Salinity S ‰
				June 16, 1911						
1885	3:45 a.m.	39_5	32° 22?7	117° 17?1	0	16?7	2716	2582	2468	33.80
1886	4:12 a.m.	40_5	32 23.5	117 18.0	137	9.45	2739	2604	2635	34.09
1887	4:12 a.m.	40_5	From 4:12 to 6:20		92	9.70	2701	2568	2594	33.61?
1888	4:12 a.m.	40_5	a.m. the boat		13	16.40	2721	2587	2480	33.86
1889	4:15 a.m.	40_5	drifted from the		0	16.8	2710	2576	2460	33.73
1890	4:30 a.m.	40_5	above position		110	9.55	2728	2593	2622	33.95
1891	4:30 a.m.	40_5	to the following		73	9.75	.....	.....	.....	.....
1892	4:30 a.m.	40_5	position		27	12.90	2696	2563	2531	33.55
1893	4:40 a.m.	40_5			82	9.65	2727	2592	2620	33.94?
1894	4:40 a.m.	40_5			55	10.40	2713	2579	2593	33.76
1895	4:40 a.m.	40_5			7	16.85	2704	2571	2454	33.65
1896	4:45 a.m.	40_5			0	16.8	2703	2570	2453	33.64
1897	5:38 a.m.	40_5			46	10.50	.....	.....	.....	.....
1898g	5:38 a.m.	40_5			18	15.40	.....	.....	.....	.....
1899g	5:38 a.m.	40_5			6	16.90	2698	2565	2446	33.58
1900g	5:45 a.m.	40_5			0	16.6	.....	.....	.....	.....
1901g	5:55 a.m.	40_5			82	9.80	2712	2578	2603	33.75
1902	5:55 a.m.	40_5			64	.....	2702	2569	.....	33.63
1903g	5:55 a.m.	40_5			11	16.40	2697	2564	2457	33.57
1904g	6:10 a.m.	40_5			37	11.15	.....	.....	.....	.....
1905g	6:10 a.m.	40_5			16	15.40	2700	2567	2482	33.60
1906g	6:10 a.m.	40_5			9	.....	2697	2564	.....	33.57
1907	6:20 a.m.	39.5_5	32 23.2	117 17.5	0	16.8	2716	2582	2466	33.80?
1908g	7:48 a.m.	40_5	32 23.5	117 18.0	137	9.55	2744	2609	2639	34.15
1909g	7:48 a.m.	40_5	From 6:45 to 9:43		92	9.60	.....	.....	.....	.....
1910g	7:48 a.m.	40_5	a.m. the boat		13	.....	2700	2567	.....	33.60
1911	7:50 a.m.	40_5	drifted from the		0	16.8	2693	2560	2454	33.52
1912g	8:02 a.m.	40_5	above position		110	9.60	2718	2584	2613	33.83
1913g	8:02 a.m.	40_5	to the following		73	9.85	2714	2580	2604	33.78
1914g	8:02 a.m.	40_5	position		27	13.55	2697	2564	2520	33.57
1915g	8:10 a.m.	40_5			82	9.70	2715	2581	2607	33.79
1916g	8:10 a.m.	40_5			55	10.40	2717	2583	2598	33.81
1917g	8:10 a.m.	40_5			7	16.50	2704	2571	2461	33.65
1918	8:40 a.m.	40_5			0	16.95	2707	2574	2453	33.69
1919	9:25 a.m.	39_5			46	10.50	2702	2569	2582	33.63
1920	9:25 a.m.	39_5			18	15.70	2716	2582	2493	33.80
1921	9:25 a.m.	39_5			6	16.85	2718	2584	2466	33.83
1922	9:35 a.m.	39_5			82	9.75	2733	2598	2624	34.01
1923	9:35 a.m.	39_5			64	10.10	2709	2575	2595	33.71
1924	9:35 a.m.	39_5			11	16.50	.....	.....	.....	.....
1925	9:40 a.m.	39_5			37	11.15	2712	2578	2580	33.75
1926	9:40 a.m.	39_5			16	15.90	2714	2580	2486	33.78
1927	9:40 a.m.	39_5			9	15.60	2712	2578	2467	33.75
1928	9:43 a.m.	39_5	32 23.0	117 17.4	0	17.0	2722	2588	2462	33.88
1929	10:00 a.m.	40_5	32 24.6	117 18.7	17	16.25	.....	.....	.....	.....
1930	10:00 a.m.	40_5	32 24.6	117 18.7	11	16.60	.....	.....	.....	.....
1931	10:00 a.m.	40_5	32 24.6	117 18.7	5	17.10	.....	.....	.....	.....
1932	10:00 a.m.	40_5	32 24.6	117 18.7	0	17.1	.....	.....	.....	.....
1933	10:00 a.m.	40_5	32 24.6	117 18.7	20	16.00	.....	.....	.....	.....
1934	10:00 a.m.	40_5	32 24.6	117 18.7	12	16.50	.....	.....	.....	.....
1935	10:00 a.m.	40_5	32 24.6	117 18.7	8	16.80	.....	.....	.....	.....
1936	10:20 a.m.	39.5_5	32 24.7	117 17.5	17	16.30	.....	.....	.....	.....
1937	10:20 a.m.	39.5_5	32 24.7	117 17.5	11	16.60	.....	.....	.....	.....
1938	10:20 a.m.	39.5_5	32 24.7	117 17.5	5	17.00	.....	.....	.....	.....
1939	10:20 a.m.	39.5_5	32 24.7	117 17.5	0	17.05	.....	.....	.....	.....
1940	10:20 a.m.	39.5_5	32 24.7	117 17.5	20	16.30	.....	.....	.....	.....
1941	10:20 a.m.	39.5_5	32 24.7	117 17.5	12	16.50	.....	.....	.....	.....
1942	10:20 a.m.	39.5_5	32 24.7	117 17.5	8	16.75	.....	.....	.....	.....
1943	10:30 a.m.	39_5	32 24.7	117 17.0	17	16.20	.....	.....	.....	.....
1944	10:30 a.m.	39_5	32 24.7	117 17.0	11	16.45	.....	.....	.....	.....
1945	10:30 a.m.	39_5	32 24.7	117 17.0	5	16.95	.....	.....	.....	.....
1946	10:30 a.m.	39_5	32 24.7	117 17.0	0	16.95	.....	.....	.....	.....
1947	10:30 a.m.	39_5	32 24.7	117 17.0	20	15.75	.....	.....	.....	.....

g Indicates that the gas content of the sample was determined; see Table 3.

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position		Depth in meters	Temperature in centigrade	Specific gravity			Salinity S ‰
			North latitude	West longitude			0° S 15.0	17.5 S 15.0	t° S 15.0	
				June 16, 1911						
1948	10:30 a.m.	39$_5$	32° 24.7	117° 17.0	12	16.30				
1949	10:30 a.m.	39$_5$	32 24.7	117 17.0	8	16.70				
1950	10:40 a.m.	39$_5$	32 24.7	117 16.4	17	14.40				
1951	10:40 a.m.	39$_5$	32 24.7	117 16.4	11	16.30				
1952	10:40 a.m.	39$_5$	32 24.7	117 16.4	5	16.60				
1953	10:40 a.m.	39$_5$	32 24.7	117 16.4	0	16.8				
1954	10:40 a.m.	39$_5$	32 24.7	117 16.4	20	14.85				
1955	10:40 a.m.	39$_5$	32 24.7	117 16.4	12	16.30				
1956	10:40 a.m.	39$_5$	32 24.7	117 16.4	8	16.55				
1957	10:55 a.m.	39$_5$	32 24.7	117 15.4	17	16.30				
1958	10:55 a.m.	39$_5$	32 24.7	117 15.4	11	16.55				
1959	10:55 a.m.	39$_5$	32 24.7	117 15.4	5	16.70				
1960	10:55 a.m.	39$_5$	32 24.7	117 15.4	0	16.8				
1961	10:55 a.m.	39$_5$	32 24.7	117 15.4	20	16.20				
1962	10:55 a.m.	39$_5$	32 24.7	117 15.4	12	16.55				
1963	10:55 a.m.	39$_5$	32 24.7	117 15.4	8	16.75				
1964	11:15 a.m.	39$_5$	32 24.1	117 15.2	17	16.50				
1965	11:15 a.m.	39$_5$	32 24.1	117 15.2	11	16.75				
1966	11:15 a.m.	39$_5$	32 24.1	117 15.2	5	16.85				
1967	11:15 a.m.	39$_5$	32 24.1	117 15.2	0	16.9				
1968	11:15 a.m.	39$_5$	32 24.1	117 15.2	20	16.25				
1969	11:15 a.m.	39$_5$	32 24.1	117 15.2	12	16.65				
1970	11:15 a.m.	39$_5$	32 24.1	117 15.2	8	16.75				
				June 17, 1911						
1971	1:40 a.m.	40$_1$	32 21.6	117 20.5	137	9.65	2730	2595	2624	33.97
1972	1:40 a.m.	40$_1$	From 1:30 to 3:55		92	9.75	2716	2582	2608	33.80
1973	1:40 a.m.	40$_1$	a.m. the boat		13	17.0	2700	2567	2446	33.60
1974	1:45 a.m.	40$_1$	drifted from the		0	17.2	2719	2585	2459	33.84
1975	2:00 a.m.	40$_1$	above position		110	9.60	2732	2597	2625	34.00
1976	2:00 a.m.	40$_1$	to the following		73	10.35	2703	2570	2585	33.64
1977	2:00 a.m.	40$_1$	position		27	13.20	2694	2561	2523	33.53
1978	2:12 a.m.	40$_1$			82	9.95	2703	2570	2592	33.64
1979	2:12 a.m.	40$_1$			55	11.05	2696	2563	2566	33.55
1980	2:12 a.m.	40$_1$			7	17.15	2702	2569	2444	33.63
1981	2:25 a.m.	40$_1$			0	17.1	2704	2571	2447	33.65
1982	3:25 a.m.	40$_1$			137	9.40	2740	2605	2637	34.10
1983	3:25 a.m.	40$_1$			92	9.60	2709	2575	2604	33.71
1984	3:25 a.m.	40$_1$			13	16.60	2696	2563	2451	33.55
1985	3:35 a.m.	40$_1$			46	11.90	2696	2563	2550	33.55
1986	3:35 a.m.	40$_1$			18	15.30	2698	2565	2482	33.58
1987	3:35 a.m.	40$_1$			6	17.15	2702	2569	2445	33.63
1988	3:45 a.m.	40$_1$			82	10.20	2705	2572	2589	33.66
1989	3:45 a.m.	40$_1$			64	11.15	2701	2568	2569	33.61
1990	3:45 a.m.	40$_1$			11	16.65	2699	2566	2453	33.59
1991	3:55 a.m.	40$_1$			37	12.50	2695	2562	2538	33.54
1992	3:55 a.m.	40$_1$			16		2700	2567		33.60
1993	3:55 a.m.	40$_1$			9	16.85	2700	2567	2449	33.60
1994	4:00 a.m.	40$_1$	32 20.7	117 20.0	0	17.1	2702	2569	2446	33.63
1995	4:30 a.m.	40$_1$	32 22.4	117 21.2	92	9.80	2703	2570	2595	33.64
1996	4:30 a.m.	40$_1$	From 4:30 to 6:10		13	17.15	2702	2569	2445	33.63
1997	4:35 a.m.	40$_1$	a.m. the boat		0	17.1	2702	2569	2446	33.63
1998	4:45 a.m.	40$_1$	drifted from the		110	9.65	2721	2587	2615	33.86
1999	4.45 a.m.	40$_1$	above position		73	10.15	2700	2567	2586	33.60
2000	4:45 a.m.	40$_1$	to the following		27	13.85	2693	2560	2510	33.52
2001	4:50 a.m.	40$_1$	position		82	9.95				
2002	4:50 a.m.	40$_1$			55	10.95	2689	2556	2562	33.47
2003	4:50 a.m.	40$_1$			7	17.15	2711	2577	2453	33.74
2004	5:00 a.m.	40$_1$			0	17.1	2701	2568	2445	33.61
2005	5:54 a.m.	40$_1$			46	11.45	2704	2571	2566	33.65
2006	5:54 a.m.	40$_1$			18	15.60	2704	2571	2483	33.65
2007	5:54 a.m.	40$_1$			6	17.05	2704	2571	2448	33.65
2008	6:00 a.m.	40$_1$			82	10.10	2710	2576	2596	33.73
2009	6:00 a.m.	40$_1$			64	11.20	2701	2568	2568	33.61
2010	6:00 a.m.	40$_1$			11	17.05	2705	2572	2450	33.66

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° S / 4°0	Specific gravity: 17°5 S / 17°5	Specific gravity: t° S / 4°0	Salinity S ‰
				June 17, 1911						
2011	6:05 a.m.	40_4			37	12°50	2709	2575	2551	33.71
2012	6:05 a.m.	40_4			16	16.40	2701	2568	2461	33.61
2013	6:05 a.m.	40_4			9	17.05	2701	2568	2446	33.61
2014	6:10 a.m.	40_4	32° 21'0	117° 20'2	0	17.0	2705	2572	2451	33.66
2015	6:55 a.m.	40_4	32 22.4	117 21.2	0	16.9	2712	2578	2460	33.75
2016g	7:05 a.m.	40_4	From 6:55 to 8:45		137	9.35	2736	2601	2634	34.05
2017g	7:05 a.m.	40_4	a.m. the boat		92	9.60	.....	.....	.....	.....
2018g	7:05 a.m.	40_4	drifted from the		13	17.00	2700	2567	2446	33.60
2019g	7:18 a.m.	40_4	above position		110	9.70	.....	.....	.....	.....
2020g	7:18 a.m.	40_4	to the following		73	9.90	2704	2571	2594	33.65
2021	7:18 a.m.	40_4	position		27	13.80	.....	.....	.....	.....
2022	7:30 a.m.	40_4			82	9.55	2710	2576	2605	33.73
2023g	7:30 a.m.	40_4			55	10.85	2698	2565	2571	33.58
2024g	7:30 a.m.	40_4			7	17.00	2702	2569	2448	33.63
2025	7:38 a.m.	40_4			0	16.9	2707	2574	2455	33.69
2026	8:30 a.m.	40_4			0	16.9	2710	2576	2458	33.73
2027g	8:30 a.m.	40_4			46	11.40	2695	2562	2559	33.54
2028	8:30 a.m.	40_4			18	16.65	2702	2569	2455	33.63
2029g	8:30 a.m.	40_4			6	17.00	2700	2567	2446	33.60
2030	8:35 a.m.	40_4			82	9.70	2705	2572	2598	33.66
2031g	8:35 a.m.	40_4			64	10.85	.....	.....	.....	.....
2032	8:35 a.m.	40_4			11	17.00	2702	2569	2447	33.63
2033g	8:45 a.m.	40_4			37	12.40	2690	2557	2535	33.48
2034g	8:45 a.m.	40_4			16	16.45	2695	2562	2454	33.54
2035g	8:45 a.m.	40_4	32 21.4	117 20.2	9	16.95	2706	2573	2453	33.68
2036	8:55 a.m.	40_4	32 21.5	117 20.2	0	16.95	2698	2565	2445	33.58
2037	10:15 a.m.	40_4	32 22.4	117 19.9	0	17.05	2702	2569	2448	33.63
2038	10:20 a.m.	$40_{4.5}$	32 22.5	117 19.1	0	17.0	2705	2572	2451	33.66
2039	10:25 a.m.	40_5	32 22.6	117 18.3	0	17.05	2704	2571	2449	33.65
2040	10:30 a.m.	39.5_5	32 22.7	117 17.5	0	17.15	2708	2574	2450	33.70
2041	10:35 a.m.	39_5	32 22.8	117 16.7	0	17.2	2705	2572	2447	33.66
2042	10:40 a.m.	39_5	32 22.9	117 15.9	0	17.15	2702	2569	2444	33.63
2043	10:45 a.m.	39_5	32 23.0	117 15.1	0	.....	2707	2574	.....	33.69
2044	10:50 a.m.	39_5	32 23.2	117 14.5	0	17.7	2707	2574	2435	33.69
2045	11:20 a.m.	39_5	32 24.4	117 14.5	0	17.8	2707	2574	2434	33.69
				June 18, 1911						
2046	2:00 a.m.	40_5	32 22.7	117 19.2	137	9.50	2740	2605	2635	34.10
2047	2:00 a.m.	40_5	From 2:00 to 3:55		92	9.80	2720	2586	2611	33.85
2048	2:00 a.m.	40_5	a.m. the boat		13	16.70	2700	2567	2453	33.60
2049	2:00 a.m.	40_5	drifted from the		0	17.2	2705	2572	2446	33.66
2050	2:10 a.m.	40_5	above position		110	9.65	2727	2592	2620	33.94
2051	2:10 a.m.	40_5	to the following		73	10.00	2706	2573	2594	33.68
2052	2:10 a.m.	40_5	position		27	12.90	2696	2563	2531	33.55
2053	2:20 a.m.	40_5			82	9.90	2709	2575	2598	33.71
2054	2:20 a.m.	40_5			55	10.0?	2697	2564	2585	33.57
2055	2:20 a.m.	40_5			7	16.90	2706	2573	2453	33.68
2056	2:35 a.m.	40_5			0	17.1	2707	2574	2451	33.69
2057	3:35 a.m.	40_4			46	11.15	2707	2574	2575	33.69
2058	3:35 a.m.	40_4			18	14.50	2696	2563	2498	33.55
2059	3:35 a.m.	40_4			6	16.95	2700	2567	2448	33.60
2060	3:40 a.m.	40_4			82	.....	2703	2570	.....	33.64
2061	3:40 a.m.	40_4			64	10.75	2700	2567	2575	33.60
2062	3:40 a.m.	40_4			11	16.75	2703	2570	2454	33.64
2063	3:40 a.m.	40_4			0	16.95	2704	2571	2451	33.65
2064	3:50 a.m.	40_4			37	12.05	2692	2559	2544	33.50
2065	3:50 a.m.	40_4			16	14.85	2695	2562	2490	33.54
2066	3:50 a.m.	40_4	32 22.2	117 18.8	9	16.80	2720	2586	2470	33.85
2067	4:05 a.m.	40_5	32 22.7	117 19.2	137	9.55	.....	.....	.....	.....
2068	4:05 a.m.	40_5	From 4:05 to 5:45		92	9.75	2723	2588	2615	33.89
2069	4:05 a.m.	40_5	a.m. the boat		13	16.65	2701	2568	2455	33.61
2070	4:05 a.m.	40_5	drifted from the		0	17.0	2711	2577	2456	33.74
2071	4:15 a.m.	40_5	above position		110	9.50	.....	.....	.....	.....
2072	4:15 a.m.	40_5	to the following		73	9.90	2717	2583	2606	33.81
2073	4:15 a.m.	40_5	position		27	12.70	2693	2560	2532	33.52

g, Indicates that the gas content of the sample was determined; see Table 3.

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° S / 4°0	Specific gravity: 17°5 S / 17°5	Specific gravity: t° S / 4°0	Salinity S ‰
				June 18, 1911						
2074	4:25 a.m.	40$_5$			82	9°70	2724	2589	2616	33.90
2075	4:25 a.m.	40$_5$			55	10.40	2700	2567	2581	33.60
2076	4:25 a.m.	40$_5$			7	16.70	2705	2572	2457	33.66
2077	4:35 a.m.	40$_5$			0	17.0	2705	2572	2451	33.66
2078	4:50 a.m.	40$_4$			0	17.0	2718	2584	2463	33.83
2079	5:27 a.m.	40$_4$			16	11.15	2694	2561	2562	33.53
2080	5:27 a.m.	40$_4$			18	14.45	2690	2557	2493	33.48
2081	5:27 a.m.	40$_4$			6	17.00	2705	2572	2451	33.66
2082	5:30 a.m.	40$_4$			82	9.65	2719	2585	2612	33.84
2083	5:30 a.m.	40$_4$			64	10.20	2703	2570	2588	33.64
2084	5:40 a.m.	40$_4$			0	17.05	2723	2588	2469	33.89
2085	5:42 a.m.	40$_4$			37	11.90	2696	2563	2550	33.55
2086	5:42 a.m.	40$_4$			16	15.50	2697	2564	2478	33.57
2087	5:42 a.m.	40$_4$	32° 22'2	117° 18'8	9	16.95	2699	2566	2447	33.59
2088	6:00 a.m.	40$_4$	32 22.7	117 19.2	137	9.50	.....	.....	...	... ...
2089	6:00 a.m.	40$_5$	From 6:00 to 7:30		92	9.65	2721	2587	2614	33.86
2090	6:00 a.m.	40$_5$	a.m. the boat		13	16.75	2701	2568	2453	33.61
2091	6:08 a.m.	40$_5$	drifted from the		110	9.55	2728	2593	2622	33.95
2092	6:08 a.m.	40$_5$	above position		73	9.95	2709	2575	2597	33.71
2093	6:08 a.m.	40$_5$	to the following		27	13.40	2691	2558	2517	33.49
2094	6:08 a.m.	40$_5$	position		82	9.70	2731	2596	2622	33.99
2095	6:10 a.m.	40$_5$			55	10.95	2708	2574	2580	33.70
2096	6:10 a.m.	40$_5$			7	17.15	2717	2583	2460	33.81
2097	7:00 a.m.	40$_4$			0	17.1	.....	.....	.....	.....
2098	7:20 a.m.	40$_4$			82	9.80	2730	2595	2621	33.98
2099	7:20 a.m.	40$_4$			64	10.90	2718	2584	2591	33.83
2100	7:20 a.m.	40$_4$			11	17.05	2719	2585	2464	33.84
2101	7:25 a.m.	40$_4$			37	11.80	2709	2575	2565	33.71
2102	7:25 a.m.	40$_4$			16	16.50	2714	2580	2472	33.78
2103	7:25 a.m.	40$_4$			9	17.25	2711	2577	2451	33.74
2104	7:30 a.m.	40$_4$	32 22.2	117 18.8	0	17.3	2720	2586	2458	33.85
				June 20, 1911						
2105	4:35 a.m.	40$_5$	32 23.5	117 18.0	0	17.2	2700	2567	2441	33.60
2106	4:35 a.m.	40$_5$	From 4:35 to 6:40		137	9.60	2725	2590	2617	33.91
2107	4:35 a.m.	40$_5$	a.m. the boat		92	9.70	2713	2579	2608	33.76
2108	4:35 a.m	40$_5$	drifted from the		13	.....	2704	2571	.....	33.65
2109	4:35 a.m.	40$_5$	above position		7	17.05	2701	2568	2446	33.61
2110	4:55 a.m.	40$_5$	to the following		110	9.60	2719	2585	2614	33.84
2111	4:55 a.m.	40$_5$	position		46	11.40	2699	2566	2563	33.59
2112	4:55 a.m.	40$_5$			37	12.40	2689	2556	2533	33.47
2113	4:55 a.m.	40$_5$			27	13.15	2694	2563	2524	33.53
2114	5:20 a.m.	40$_5$			0	17.0	2702	2569	2448	33.63
2115	6:09 a.m.	39$_5$			82	9.65	2722	2588	2615	33.88
2116	6:09 a.m.	39$_5$			55	10.00	2716	2582	2603	33.80
2117	6:09 a.m.	39$_5$			22	.....	2696	2563	.....	33.55
2118	6:09 a.m.	39$_5$			18	16.45	2698	2565	2457	33.58
2119	6:10 a.m.	39$_5$			0	16.9	2705	2572	2453	33.66
2120	6:23 a.m.	39$_5$			73	9.90	2720	2586	2609	33.85
2121	6:23 a.m.	39$_5$			46	11.10	2697	2564	2565	33.57
2122	6:23 a.m.	39$_5$			16	15.45	2699	2566	2481	33.59
2123	6:23 a.m.	39$_5$			9	16.85	2700	2567	2449	33.60
2124	6:35 a.m.	39$_5$			64	10.00	2720	2586	2607	33.85
2125	6:35 a.m.	39$_5$			37	11.65	2692	2559	2551	33.50
2126	6:35 a.m.	39$_5$			11	16.85	2710	2576	2459	33.73
2127	6:35 a.m.	39$_5$	32 23.0	117 17.2	6	16.95	2701	2568	2448	33.61
2128	7:05 a.m.	40$_5$	32 23.5	117 18.0	0	17.1	2702	2569	2446	33.63
2129	7:40 a.m.	40$_5$	From 7:05 to 9:35		137	9.60	2726	2591	2620	33.93
2130	7:40 a.m.	40$_5$	a.m. the boat		92	9.85	2716	2585	2607	33.80
2131	7:40 a.m.	40$_5$	drifted from the		13	16.50	2700	2567	2457	33.60
2132	7:40 a.m.	40$_5$	above position		7	17.15	2706	2573	2449	33.68
2133	7:50 a.m.	40$_5$	to the following		0	17.15	2706	2573	2449	33.68
2134	7:50 a.m.	40$_5$	position		110	.....	2725	2590	.....	33.91
2135	7:50 a.m.	40$_5$			46	11.35	.....	.....	.....	...
2136	7:50 a.m.	40$_5$			37	12.00	2692	2559	2544	33.50

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° / 4°0	Specific gravity: S / 17°5	Specific gravity: t° / 4°0	Salinity S ‰
				June 20, 1911						
2137	7:50 a.m.	40_5			27	13?40	2701	2568	2526	33.61
2138	9:10 a.m.	39_5			82	9.70	.....	....	....	.....
2139	9:10 a.m.	39_5			55	10.65	.....	.....	.....	.....
2140	9:10 a.m.	39_5			22	14.70	.....	.....	.....	.....
2141	9:10 a.m.	39_5			18	15.30	2700	2567	2485	33.60
2142	9:20 a.m.	39_5			73	10.10	2721	2587	2606	33.86
2143	9:20 a.m.	39_5			46	11.60	.....	.....	.....	.....
2144	9:20 a.m.	39_5			16	15.50	2704	2571	2485	33.65
2145	9:20 a.m.	39_5			9	16.70	2690	2557	2443	33.48
2146	9:35 a.m.	39_5	32° 23?6	117° 17?0	0	17.3	.....	.....	.....	.....
2147	10:15 a.m.	39_4	32 20.0	117 17.4	0	17.5	2702	2569	2436	33.63
2148	10:40 a.m.	39_4	32 20.0	117 17.4	0	17.5	.....	.....	.....	.....
				June 21, 1911						
2149	5:45 a.m.	40_4	32 22.4	117 21.2	0	17.1	2713	2579	2457	33.76
2150	6:55 a.m.	40_3	32 23.6	117 20.9	0	17.0	2706	2573	2452	33.68
2151	8:20 a.m.	40_4	32 22.4	117 21.2	1290	3.50	.....	.....	.....	.....
2152	8:55 a.m.	40_3	32 22.7	117 20.7	1240	3.60	2770	2633	2743	34.47
2153	8:55 a.m.	40_3	32 22.7	117 20.7	1230	3.60	2771	2634	2744	34.48
2162	11:15 a.m.	40_4	32 22.3	117 19.7	460	7.80	2742	2607	2664	34.12
2163	11:15 a.m.	40_4	32 22.3	117 19.7	275	9.05	.....	.....	.....	.....
2164	11:15 a.m.	40_4	32 22.3	117 19.7	185	9.20	.....	.....	.....	.....
2165	11:15 a.m.	40_4	32 22.3	117 19.7	33	13.55	2705	2572	2527	33.66
2166	1:00 p.m.	40_3	32 22.7	117 19.2	550	6.45	2758	2622	2699	34.32
2167	1:00 p.m.	40_3	32 22.7	117 19.2	545	.....	2759	2623	.....	34.34
2168	1:00 p.m.	40_3	32 22.7	117 19.2	540	6.55	2764	2628	2703	34.40
2169	1:00 p.m.	40_3	32 22.7	117 19.2	530	6.70	2757	2621	2694	34.31
2170	1:25 p.m.	40_3	32 22.7	117 19.2	460	7.35	2739	2604	2668	34.09
2171	1:25 p.m.	40_3	32 22.7	117 19.2	365	7.90	2754	2618	2674	34.27
2172	1:25 p.m.	40_3	32 22.7	117 19.2	275	8.90	2758	2622	2662	34.32
2173	1:25 p.m.	40_3	32 22.7	117 19.2	185	9.55	2731	2596	2626	33.99
				June 22, 1911						
2174	1:40 a.m.	39_5	32 25.2	117 14.9	0	17.2	2716	2582	2456	33.80
2175	2:00 a.m.	39_5	32 26.4	117 16.3	0	17.4	.....	....	.....	....
2176	2:20 a.m.	40_5	32 27.7	117 17.8	0	17.5	....	....	.....	....
2177	2:40 a.m.	40_5	32 29.0	117 19.2	0	17.6	2715	2581	2446	33.79
2178	3:00 a.m.	40_5	32 30.2	117 20.9	0	17.3	.....	....	.....	....
2179	3:20 a.m.	40_5	32 31.6	117 22.3	0	17.05	....	....	....	....
2180	3:40 a.m.	41_5	32 32.8	117 23.7	0	17.1	2701	2568	2446	33.61
2181	4:00 a.m.	41_5	32 34.1	117 25.2	0	17.2	....	.....	.....	.....
2182	4:20 a.m.	41_5	32 35.3	117 26.7	0	17.2	.....	....	....	....
2183	4:40 a.m.	42_5	32 36.6	117 28.1	0	17.15	2719	2585	2462	33.84
2184	5:00 a.m.	42_5	32 37.8	117 29.6	0	17.15	.....	....	....	....
2185	5:30 a.m.	42_5	32 40.0	117 32.0	137	8.95	2724	2589	2628	33.90
2186	5:30 a.m.	42_5	32 40.0	117 32.0	92	9.80	2711	2577	2602	33.74
2187	5:30 a.m.	42_5	32 40.0	117 32.0	13	17.20	2708	2574	2448	33.70
2188	5:30 a.m.	42_5	32 40.0	117 32.0	7	17.20	2703	2570	2443	33.64
2189	5:35 a.m.	42_5	32 40.0	117 32.0	0	17.15	2706	2573	2449	33.68
2190	5:40 a.m.	42_5	32 40.0	117 32.0	110	9.40	2712	2578	2609	33.75
2191	5:40 a.m.	42_5	32 40.0	117 32.0	46	11.55	2689	2556	2550	33.47
2192	5:40 a.m.	42_5	32 40.0	117 32.0	37	13.00	2698	2565	2531	33.58
2193	5:40 a.m.	42_5	32 40.0	117 32.0	27	14.25	2715	2581	2522	33.79
2194	6:00 a.m.	42_5	32 40.0	117 32.0	0	17.1	2709	2575	2453	33.71
2195	7:00 a.m.	42_5	32 40.0	117 32.0	82	10.00	2708	2574	2596	33.70
2196	7:00 a.m.	42_5	32 40.0	117 32.0	55	11.40	2697	2564	2560	33.57
2197	7:00 a.m.	42_5	32 40.0	117 32.0	22	16.05	.....	....	....	....
2198	7:00 a.m.	42_5	32 40.0	117 32.0	18	17.15	2710	2576	2453	33.73
2199	7:07 a.m.	42_5	32 40.0	117 32.0	73	10.45	2714	2580	2595	33.78
2200	7:07 a.m.	42_5	32 40.0	117 32.0	46	11.85	2692	2559	2547	33.50
2201	7:07 a.m.	42_5	32 40.0	117 32.0	16	17.15	2699	2566	2442	33.59
2202	7:07 a.m.	42_5	32 40.0	117 32.0	9	17.15	2712	2578	2455	33.75
2203	7:15 a.m.	42_5	32 40.0	117 32.0	11	17.15	2722	2588	2463	33.88
2204	7:15 a.m.	42_5	32 40.0	117 32.0	6	17.15	2701	2568	2443	33.61
2205	7:18 a.m.	42_5	32 40.0	117 32.0	0	17.15	2704	2571	2445	33.65
2206	8:00 a.m.	42_5	32 44.0	117 31.4	0	17.1	2707	2574	2451	33.69

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position		Depth in meters	Temperature in centigrade	Specific gravity			Salinity S ‰
			North latitude	West longitude			$S\frac{0°}{4°0}$	$S\frac{17°5}{17°5}$	$S\frac{t°}{4°0}$	
				June 22, 1911						
2207	8:20 a.m.	42_9	32° 46'8	117° 30'9	0	17°2	.....	.....	.....	.....
2208	8:40 a.m.	42_{10}	32 49.6	117 30.4	0	17.35	.....	.....	.....	.....
2209	9:15 a.m.	42_{10}	32 52.0	117 30.0	137	8.90	2726	2591	2631	33.93
2210	9:15 a.m.	42_{10}	32 52.0	117 30.0	92	9.65	2707	2574	2600	33.69
2211	9:15 a.m.	42_{10}	32 52.0	117 30.0	13	17.35	2706	2573	2443	33.68
2212	9:15 a.m.	42_{10}	32 52.0	117 30.0	7	17.40	2704	2571	2439	33.65
2213	9:20 a.m.	42_{10}	32 52.0	117 30.0	0	17.5	2706	2573	2440	33.68
2214	9:30 a.m.	42_{10}	32 52.0	117 30.0	110	9.45	2727	2592	2624	33.94
2215	9:30 a.m.	42_{10}	32 52.0	117 30.0	46	11.05	2694	2561	2565	33.53
2216	9:30 a.m.	42_{10}	32 52.0	117 30.0	37	11.95	2693	2560	2546	33.52
2217	9:30 a.m.	42_{10}	32 52.0	117 30.0	27	13.20	2695	2562	2525	33.54
2218	10:05 a.m.	42_{10}	32 52.0	117 30.0	82	9.80	2710	2576	2602	33.73
2219	10:05 a.m.	42_{10}	32 52.0	117 30.0	55	10.85	2691	2558	2565	33.49
2220	10:05 a.m.	42_{10}	32 52.0	117 30.0	22	14.50	2700	2567	2502	33.60
2221	10:05 a.m.	42_{10}	32 52.0	117 30.0	18	15.95	2698	2565	2469	33.58
2222	10:15 a.m.	42_{10}	32 52.0	117 30.0	73	10.20	2708	2574	2592	33.70
2223	10:15 a.m.	42_{10}	32 52.0	117 30.0	46	11.05	2694	2561	2565	33.53
2224	10:15 a.m.	42_{10}	32 52.0	117 30.0	16	15.55	2698	2565	2477	33.58
2225	10:15 a.m.	42_{10}	32 52.0	117 30.0	9	17.45	2706	2573	2441	33.68
2226	10:30 a.m.	42_{10}	32 52.0	117 30.0	64	10.35	2703	2570	2584	33.64
2227	10:30 a.m.	42_{10}	32 52.0	117 30.0	37	11.90	2695	2562	2549	33.54
2228	10:30 a.m.	42_{10}	32 52.0	117 30.0	11	17.40	2707	2574	2443	33.69
2229	10:30 a.m.	42_{10}	32 52.0	117 30.0	5	17.45	2704	2571	2440	33.65
2230	10:33 a.m.	42_{10}	32 52.0	117 30.0	0	17.6	2712	2578	2444	33.75
2231	10:40 a.m.	42_{10}	32 51.0	117 30.7	0	17.6	..	..	..	..
2232	11:00 a.m.	43_{10}	32 51.8	117 33.6	0	17.55	2711	2577	2444	33.74
2233	11:20 a.m.	43_{10}	32 51.6	117 36.4	0	17.8	..	..	..	..
2234	11:40 a.m.	44_{10}	32 51.4	117 39.0	0	17.8	..	..	..	..
2235	11:52 a.m.	44_{10}	32 51.3	117 40.5	92	9.50	2715	2581	2612	33.79
2236	11:52 a.m.	44_{10}	32 51.3	117 40.5	55	11.05	2707	2574	2578	33.69
2237	11:52 a.m.	44_{10}	32 51.3	117 40.5	27	14.40	2704	2571	2508	33.65
2238	12:15 p.m.	44_{10}	32 51.3	117 40.5	37	11.95	2704	2571	2557	33.65
2239	12:15 p.m.	44_{10}	32 51.3	117 40.5	18	16.10	2721	2587	2487	33.86
2240	12:15 p.m.	44_{10}	32 51.3	117 40.5	9	17.20	2721	2587	2460	33.86
2241	12:15 p.m.	44_{10}	32 51.3	117 40.5	0	18.0	2710	2576	2432	33.73
2242	1:00 p.m.	45_{10}	32 50.8	117 45.7	0	17.4	2714	2580	2450	33.78
2243	1:20 p.m.	46_{10}	32 50.7	117 48.4	0	17.2	2705	2572	2445	33.66
2244	1:40 p.m.	46_{10}	32 50.4	117 51.4	0	16.8	2703	2570	2452	33.64
2245	1:50 p.m.	47_{10}	32 50.3	117 52.9	92	9.90	2722	2588	2611	33.88
2246	1:50 p.m.	47_{10}	32 50.3	117 52.9	55	12.00	2697	2564	2548	33.57
2247	1:50 p.m.	47_{10}	32 50.3	117 52.9	37	13.30	2690	2557	2517	33.48
2248	1:55 p.m.	47_{10}	32 50.3	117 52.9	27	14.85	.....	.....	.....	.....
2249	1:55 p.m.	47_{10}	32 50.3	117 52.9	18	15.40	2694	2561	2478	33.53
2250	1:55 p.m.	47_{10}	32 50.3	117 52.9	9	16.15	2689	2556	2456	33.47
2251	1:55 p.m.	47_{10}	32 50.3	117 52.9	0	16.9	2700	2567	2447	33.60
2252	2:20 p.m.	47_{10}	32 50.1	117 55.5	0	16.9	2708	2574	2456	33.70
2253	2:40 p.m.	48_{10}	32 49.8	117 58.3	0	17.0	2699	2566	2446	33.59
2254	3:00 p.m.	48_{10}	32 49.6	118 1.2	0	17.1	2695	2562	2438	33.54
2255	3:20 p.m.	49_{10}	32 49.5	118 3.9	0	16.9	2698	2565	2447	33.58
2256	3:21 p.m.	49_{10}	32 49.5	118 3.9	92	10.30	2709	2575	2593	33.71
2257	3:21 p.m.	49_{10}	32 49.5	118 3.9	55	11.40	2698	2565	2562	33.58
2258	3:21 p.m.	49_{10}	32 49.5	118 3.9	37	13.10	2691	2558	2522	33.49
2259	3:35 p.m.	49_{10}	32 49.5	118 3.9	37	12.90	2695	2562	2529	33.54
2260	3:35 p.m.	49_{10}	32 49.5	118 3.9	18	15.05	2696	2563	2486	33.55
2261	3:45 p.m.	49_{10}	32 49.5	118 3.9	0	16.15	2697	2564	2463	33.57
2262	4:20 p.m.	50_{10}	32 49.2	118 7.8	0	16.6	2699	2566	2454	33.59
2263	4:40 p.m.	50_{10}	32 48.9	118 10.1	0	16.8	2709	2575	2459	33.71
2264	5:00 p.m.	50_{10}	32 48.7	118 12.3	0	16.2	2700	2567	2463	33.60
2265	5:43 p.m.	51_{10}	32 48.3	118 17.2	0	16.0	2703	2570	2471	33.64
2266	6:30 p.m.	52_{10}	32 48.1	118 19.1	0	15.9	2703	2570	2475	33.64
2267	6:45 p.m.	52_{10}	32 48.0	118 21.4	0	15.85	.....	.....	.....	.....
				June 23, 1911						
2268	6:10 a.m.	52_{9}	32 50.0	118 20.3	92	9.60	2715	2581	2609	33.79
2269	6:10 a.m.	52_{10}	32 50.0	118 20.3	55	11.80	2700	2567	2557	33.60

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° / 4°0	Specific gravity: 17°5 / 17°5	Specific gravity: 4° / 4°0	Salinity S ‰
				June 23, 1911						
2270	6:10 a.m.	52_{10}	32° 50.0	118° 20.3	37	14°.85	.....	.....	.....	.....
2271	6:10 a.m.	52_{10}	32 50.0	118 20.3	0	17.0	2708	2574	2454	33.70
2272	6:18 a.m.	52_{10}	32 50.0	118 20.3	27	15.35	2699	2566	2483	33.59
2273	6:18 a.m.	52_{10}	32 50.0	118 20.3	18	16.95	2703	2570	2449	33.64
2274	6:18 a.m.	52_{10}	32 50.0	118 20.3	9	17.00	2701	2568	2448	33.61
2275	7:05 a.m.	52_{11}	32 55.5	118 19.6	0	17.15	2710	2576	2452	33.73
2276	7:40 a.m.	52_{12}	32 59.4	118 19.3	0	17.5	2701	2568	2435	33.61
2277	8:05 a.m.	52_{12}	33 2.2	118 19.0	0	17.45	2712	2578	2447	33.75
2278	8:30 a.m.	52_{13}	33 5.0	118 18.7	0	16.65	2704	2571	2457	33.65
2279	8:45 a.m.	52_{13}	33 6.9	118 18.6	0	16.65	2700	2567	2455	33.60
2280	9:00 a.m.	52_{14}	33 8.7	118 18.4	0	16.5	2701	2568	2457	33.61
2281	9:15 a.m.	52_{14}	33 10.4	118 18.2	0	16.2	2710	2576	2474	33.73
2282	9:25 a.m.	52_{14}	33 11.5	118 18.2	0	16.0	2694	2561	2464	33.53
2283	9:35 a.m.	52_{15}	33 12.8	118 18.1	0	16.2	2697	2564	2462	33.57
2284	9:45 a.m.	52_{15}	33 13.8	118 18.0	0	16.4	2699	2566	2460	33.59
2285	9:55 a.m.	52_{15}	33 15.0	118 18.0	0	16.2	2697	2564	2461	33.57
2286	10:05 a.m.	52_{15}	33 16.4	118 17.7	0	16.2	2699	2566	2464	33.59
2287	10:16 a.m.	$52_{15.5}$	33 17.5	118 17.6	0	17.7	2703	2570	2433	33.64
2288	10:25 a.m.	52_{16}	33 18.7	118 17.6	0	18.3	2701	2568	2415	33.61
				June 24, 1911						
2289	5:55 a.m.	51_{16}	33 19.4	118 16.7	92	9.50	2716	2582	2613	33.80
2290	5:55 a.m.	51_{6}	33 19.4	118 16.7	55	10.90	2698	2565	2571	33.58
2291	5:55 a.m.	51_{16}	33 19.4	118 16.7	37	13.15	2694	2561	2524	33.53
2292	5:55 a.m.	51_{16}	33 19.4	118 16.7	27	15.50	2697	2564	2478	33.57
2293	5:55 a.m.	51_{16}	33 19.4	118 16.7	0	17.2	2713	2579	2453	33.76
2294	6:10 a.m.	51_{16}	33 19.4	118 16.7	18	16.65	2703	2570	2456	33.64
2295	6:10 a.m.	51_{16}	33 19.4	118 16.7	9	17.05	2705	2572	2450	33.66
2296	6:25 a.m.	51_{16}	33 18.6	118 16.3	92	10.30	2719	2585	2601	33.84
2297	6:25 a.m.	51_{16}	33 18.6	118 16.3	55	10.90	2701	2568	2573	33.61
2298	6:25 a.m.	51_{16}	33 18.6	118 16.3	37	12.90	2688	2555	2525	33.45
2299	6:25 a.m.	51_{16}	33 18.6	118 16.3	27	15.35	2696	2563	2481	33.55
2300	6:25 a.m.	51_{16}	33 18.6	118 16.3	0	17.1	....	....	.....	....
2301	6:30 a.m.	51_{16}	33 18.6	118 16.3	18	16.45	2708	2574	2466	33.70
2302	6:30 a.m.	51_{16}	33 18.6	118 16.3	9	17.05	2703	2570	2447	33.64
2304	6:50 a.m.	51_{16}	33 17.7	118 16.5	55	10.95	2695	2562	2568	33.54
2305	6:50 a.m.	51_{16}	33 17.7	118 16.5	37	13.50	2697	2564	2521	33.57
2306	6:50 a.m.	51_{16}	33 17.7	118 16.5	27	14.75	2700	2567	2497	33.60
2307	6:50 a.m.	51_{16}	33 17.7	118 16.5	0	17.0	2702	2569	2449	33.63
2308	7:00 a.m.	51_{16}	33 17.7	118 16.5	18	15.40	2689	2556	2473	33.47
2309	7:00 a.m.	51_{16}	33 17.7	118 16.5	9	16.60	2710	2576	2464	33.73
2310	7:40 a.m.	52_{5}	33 14.3	118 19.0	0	16.1	.....	....	.....	.....
2311	7:52 a.m.	52_{15}	33 13.5	118 19.6	92	9.55	.....	....	.....	....
2312	7:52 a.m.	52_{15}	33 13.5	118 19.6	55	10.30	2703	2570	2590	33.64
2313	7:52 a.m.	52_{15}	33 13.5	118 19.6	37	12.00	2695	2562	2547	33.54
2314	7:52 a.m.	52_{15}	33 13.5	118 19.6	27	13.45	2713	2579	2537	33.76
2315	7:52 a.m.	52_{15}	33 13.5	118 19.6	0	16.9	2707	2574	2454	33.69
2316	8:00 a.m.	52_{15}	33 13.5	118 19.6	18	15.95	2706	2573	2475	33.68
2317	8:00 a.m.	52_{15}	33 13.5	118 19.6	9	16.60	2700	2567	2456	33.60
2318	9:02 a.m.	53_{14}	33 8.4	118 23.6	92	9.45	2725	2590	2622	33.91
2319	9:02 a.m.	53_{14}	33 8.4	118 23.6	55	11.20	2707	2574	2575	33.69
2320	9:02 a.m.	53_{14}	33 8.4	118 23.6	37	. .....	2695	2562	.....	33.54
2321	9:02 a.m.	53_{14}	33 8.4	118 23.6	27	.....	2694	2561	.....	33.53
2322	9:10 a.m.	53_{14}	33 8.4	118 23.6	0	17.5	2706	2573	2440	33.68
2323	9:10 a.m.	53_{14}	33 8.4	118 23.6	18	17.15	2710	2576	2453	33.73
2324	9:10 a.m.	53_{14}	33 8.4	118 23.6	9	17.25	2705	2572	2445	33.66
2325	9:45 a.m.	53_{13}	33 4.2	118 26.8	92	9.55	2719	2585	2614	33.84
2326	9:45 a.m.	53_{13}	33 4.2	118 26.8	55	11.50	2704	2571	2566	33.65
2327	9:45 a.m.	53_{13}	33 4.2	118 26.8	37	13.00	2707	2574	2540	33.69
2328	9:45 a.m.	53_{13}	33 4.2	118 26.8	27	14.20	2703	2570	2512	33.64
2329	9:45 a.m.	53_{13}	33 4.2	118 26.8	0	18.7	2709	2575	2414	33.71
2330	9:55 a.m.	53_{13}	33 4.2	118 26.8	18	14.55	2701	2568	2502	33.61
2331	9:55 a.m.	53_{13}	33 4.2	118 26.8	9	16.75	2699	2566	2451	33.59
2332	10:07 a.m.	54_{12}	33 2.3	118 28.2	92	9.60	2718	2584	2612	33.83
2333	10:07 a.m.	54_{12}	33 2.3	118 28.2	55	10.95	2707	2574	2579	33.69

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position		Depth in meters	Temperature in centigrade	Specific gravity			Salinity S ‰
			North latitude	West longitude			0° S — 4°0	17°5 S — 17°5	t° S — 4°0	
				June 24, 1911						
2334	10:07 a.m.	54_{12}	33° 2.3	118° 28.2	37	12°20	2699	2566	2548	33.59
2335	10:07 a.m.	54_{12}	33 2.3	118 28.2	27	12.90	2704	2571	2538	33.65
2336	10:07 a.m.	54_{12}	33 2.3	118 28.2	0	18.95	2708	2574	2405	33.70
2337	10:15 a.m.	54_{12}	33 2.3	118 28.2	18	14.40	2700	2567	2505	33.60
2338	10:15 a.m.	54_{12}	33 2.3	118 28.2	9	15.75	2697	2564	2472	33.57
2339	10:30 a.m.	54_{13}	33 2.6	118 30.8	92	9.60	2721	2587	2616	33.86
2340	10:30 a.m.	54_{13}	33 2.6	118 30.8	55	11.00	2705	2572	2575	33.66
2341	10:30 a.m.	54_{13}	33 2.6	118 30.8	37	11.75	2703	2570	2559	33.64
2342	10:30 a.m.	54_{13}	33 2.6	118 30.8	27	12.20	2700	2567	2548	33.60
2343	10:30 a.m.	54_{13}	33 2.6	118 30.8	0	18.4	2708	2574	2420	33.70
2344	10:40 a.m.	54_{13}	33 2.6	118 30.8	18	14.05	2700	2567	2511	33.60
2345	10:40 a.m.	54_{13}	33 2.6	118 30.8	9	15.65	2720	2586	2496	33.85
2346	10:40 a.m.	54_{13}	33 2.6	118 30.8	5	16.60	2710	2576	2464	33.73
2347	11:00 a.m.	55_{13}	33 2.9	118 33.3	92	9.60	2721	2587	2615	33.86
2348	11:00 a.m.	55_{13}	33 2.9	118 33.3	55	10.90	2712	2578	2585	33.75
2349	11:00 a.m.	55_{13}	33 2.9	118 33.3	37	11.50	2700	2567	2561	33.60
2350	11:00 a.m.	55_{13}	33 2.9	118 33.3	27	12.10	2702	2569	2553	33.63
2351	11:10 a.m.	55_{13}	33 2.9	118 33.3	18	13.50	2702	2569	2524	33.63
2352	11:10 a.m.	55_{13}	33 2.9	118 33.3	9	15.00	2705	2572	2497	33.66
2353	11:10 a.m.	55_{13}	33 2.9	118 33.3	5	17.20	2706	2573	2446	33.68
2354	11:10 a.m.	55_{13}	33 2.9	118 33.3	0	17.75	2710	2576	2437	33.73
2355	11:35 a.m.	55_{12}	33 2.0	118 35.0	0	16.1	2707	2574	2474	33.69
2356	11:35 a.m.	55_{12}	33 2.0	118 35.0	18	13.80	2705	2572	2522	33.66
2357	11:35 a.m.	55_{12}	33 2.0	118 35.0	9	14.20	2704	2571	2514	33.65
2358	11:35 a.m.	55_{12}	33 2.0	118 35.0	5	15.65	2707	2574	2485	33.69
2359	3:45 p.m.	52_{10}	32 50.0	118 20.3	0	18.65	2710	2576	2416	33.73
2360	4:30 p.m.	52_{10}	32 50.0	118 20.3	0	18.5	2705	2572	2414	33.66
				June 26, 1911						
2361	4:00 a.m.	40_5	32 22.7	117 19.2	0	17.9	2711	2577	2435	33.74
2362	5:45 a.m.	40_5	32 22.7	117 19.2	137	9.65	.....	.....	.....	.....
2363	5:45 a.m.	40_5	32 22.7	117 19.2	110	9.80	2726	2591	2617	33.93
2364	6:05 a.m.	40_5	32 22.7	117 19.2	0	18.0	2708	2574	2430	33.70
2365	6:45 a.m.	40_5	32 22.7	117 19.2	0	17.9	2706	2573	2430	33.68
2366	7:35 a.m.	40_4	32 22.4	117 21.2	0	17.95	2710	2576	2434	33.73
2367	8:50 a.m.	40_4	32 21.8	117 20.5	0	18.05	2704	2571	2427	33.65
				June 27, 1911						
2368	6:00 a.m.	39_5	32 23.2	117 14.7	37	10.55	2699	2566	2579	33.59
2369	6:00 a.m.	39_5	32 23.2	117 14.7	27	12.70	2694	2561	2532	33.53
2370	6:15 a.m.	39_5	32 23.2	117 14.7	18	14.45	2699	2566	2500	33.59
2371	6:15 a.m.	39_5	32 23.2	117 14.7	9	17.75	2706	2573	2434	33.68
2372	6:15 a.m.	39_5	32 23.2	117 14.7	0	18.0	2710	2576	2432	33.73
2373	6:35 a.m.	39_5	32 22.9	117 15.2	46	10.45	.....	.....	.....	.....
2374	6:35 a.m.	39_5	32 22.9	117 15.2	27	12.40	2695	2562	2539	33.54
2375	6:45 a.m.	39_5	32 22.9	117 15.2	18	14.50	2706	2573	2509	33.68
2376	6:45 a.m.	39_5	32 22.9	117 15.2	9	17.85	2701	2568	2427	33.61
2377	6:45 a.m.	39_5	32 22.9	117 15.2	0	17.8	2708	2574	2434	33.70
2378	7:16 a.m.	39_5	32 22.6	117 15.6	55	.....	2703	2570	.....	33.64
2379	7:16 a.m.	39_5	32 22.6	117 15.6	37	11.75	2715	2581	2572	33.79
2380	7:20 a.m.	39_5	32 22.6	117 15.6	46	10.85	2699	2566	2572	33.59
2381	7:20 a.m.	39_5	32 22.6	117 15.6	27	.....	2696	2563	.....	33.55
2382	7:25 a.m.	39_5	32 22.6	117 15.6	18	15.60	2702	2569	2481	33.63
2383	7:25 a.m.	39_5	32 22.6	117 15.6	9	17.85	2712	2578	2437	33.75
2384	7:25 a.m.	39_5	32 22.6	117 15.6	0	17.9	2713	2579	2435	33.76
2385	7:40 a.m.	39_5	32 22.2	117 16.1	64	10.10	2723	2588	2608	33.89
2386	7:40 a.m.	39_4	32 22.2	117 16.1	46	10.90	2700	2567	2573	33.60
2387	7:50 a.m.	39_4	32 22.2	117 16.1	37	11.15	2696	2563	2565	33.55
2388	7:50 a.m.	39_4	32 22.2	117 16.1	27	13.50	2696	2563	2519	33.55
2389	7:55 a.m.	39_4	32 22.2	117 16.1	18	15.95	2699	2566	2470	33.59
2390	7:55 a.m.	39_4	32 22.2	117 16.1	9	17.75	2705	2572	2431	33.66
2391	7:55 a.m.	39_4	32 22.2	117 16.1	0	17.65	2706	2573	2437	33.68
2392	8:50 a.m.	39_4	32 21.6	117 17.0	92	10.35	2704	2571	2585	33.65
2393	8:50 a.m.	39_4	32 21.6	117 17.0	55	10.85	2697	2564	2571	33.57
2394	9:00 a.m.	39_4	32 21.6	117 17.0	37	11.40	2702	2569	2565	33.63
2395	9:00 a.m.	39_4	32 21.6	117 17.0	27	13.55	2697	2564	2519	33.57

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position		Depth in meters	Temperature in centigrade	Specific gravity			Salinity S ‰
			North latitude	West longitude			0° / 4°0	S 17°5 / 17°5	t° / 4°0	
				June 27, 1911						
2396	9:05 a.m.	39$_4$	32° 21'6	117° 17'0	18	14°95	2699	2566	2492	33.59
2397	9:05 a.m.	39$_4$	32 21.6	117 17.0	9	17.80	2702	2569	2429	33.63
2398	9:05 a.m.	39$_4$	32 21.6	117 17.0	0	17.8	2707	2574	2434	33.69
2399	9:45 a.m.	40$_4$	32 20.9	117 18.1	92	10.90	.....	.....	.....	.....
2400	9:45 a.m.	40$_4$	32 20.9	117 18.1	55	...	2701	2568	.....	33.61
2401	9:50 a.m.	40$_4$	32 20.9	117 18.1	37	13.30	2699	2566	2526	33.59
2402	9:50 a.m.	40$_4$	32 20.9	117 18.1	27	14.70	2705	2572	2503	33.66
2403	9:55 a.m.	40$_4$	32 20.9	117 18.1	18	16.60	...	.....	.....	.....
2404	9:55 a.m.	40$_4$	32 20.9	117 18.1	9	17.85	2703	2570	2429	33.64
2405	9:55 a.m.	40$_4$	32 20.9	117 18.1	0	17.9	2706	2573	2429	33.68
2406	10:20 a.m.	40$_4$	32 20.2	117 19.0	92	9.80	2695	2562	2587	33.54?
2407	10:20 a.m.	40$_4$	32 20.2	117 19.0	55	11.90	2697	2564	2551	33.57
2408	10:30 a.m.	40$_4$	32 20.2	117 19.0	37	13.00	2700	2567	2533	33.60
2409	10:30 a.m.	40$_4$	32 20.2	117 19.0	27	15.35	2698	2565	2482	33.58
2410	10:40 a.m.	40$_4$	32 20.2	117 19.0	18	16.20	...	...	...	.....
2411	10:40 a.m.	40$_4$	32 20.2	117 19.0	9	17.75	2708	2574	2436	33.70
2412	10:40 a.m.	40$_4$	32 20.2	117 19.0	0	17.8	2708	2574	2435	33.70
2413	11:30 a.m.	40$_4$	32 19.6	117 19.8	92	9.85	2711	2577	2602	33.74
2414	11:30 a.m.	40$_4$	32 19.6	117 19.8	55	12.00	2699	2566	2551	33.59
2415	11:40 a.m.	40$_4$	32 19.6	117 19.8	37	13.70	...	.....	.....	.....
2416	11:40 a.m.	40$_4$	32 19.6	117 19.8	27	14.90	2696	2563	2491	33.55
2417	11:50 a.m.	40$_4$	32 19.6	117 19.8	18	16.10	...	...	.....	.....
2418	11:50 a.m.	40$_4$	32 19.6	117 19.8	9	17.55	2712	2578	2445	33.75
2419	11:50 a.m.	40$_4$	32 19.6	117 19.8	0	17.6	2710	2576	2442	33.73
2420	1:30 p.m.	40$_4$	32 18.3	117 21.8	92	9.50	...	...	...	.....
2421	1:30 p.m.	40$_4$	32 18.3	117 21.8	55	11.75	2694	2561	2551	33.53
2422	1:40 p.m.	40$_4$	32 18.3	117 21.8	37	12.60	...	...	...	.....
2423	1:40 p.m.	40$_4$	32 18.3	117 21.8	27	14.95	2703	2570	2497	33.64
2424	1:50 p.m.	40$_4$	32 18.3	117 21.8	18	15.20	...	...	...	.....
2425	1:50 p.m.	40$_4$	32 18.3	117 21.8	9	17.10	2704	2571	2449	33.65
2426	1:50 p.m.	40$_4$	32 18.3	117 21.8	0	17.6	2711	2577	2443	33.74
2427	2:50 p.m.	41$_4$	32 19.7	117 22.8	92	10.05	...	...	...	.....
2428	2:50 p.m.	41$_4$	32 19.7	117 22.8	55	11.40	2701	2568	2564	33.61
2429	3:00 p.m.	41$_4$	32 19.7	117 22.8	37	12.80	...	...	.....	.....
2430	3:00 p.m.	41$_4$	32 19.7	117 22.8	18	15.40	2698	2565	2482	33.58
2431	3:10 p.m.	41$_4$	32 19.7	117 22.8	27	14.30	...	...	...	.....
2432	3:10 p.m.	41$_4$	32 19.7	117 22.8	9	17.55	2710	2576	2442	33.73
2433	3:17 p.m.	41$_4$	32 19.7	117 22.8	0	18.0	2707	2574	2429	33.69
2434	3:55 p.m.	40$_4$	32 21.0	117 21.1	92	9.95	...	...	...	.....
2435	3:55 p.m.	40$_4$	32 21.0	117 21.1	55	11.30	2699	2566	2564	33.59
2436	4:05 p.m.	40$_4$	32 21.0	117 21.1	37	12.75	...	...	...	.....
2437	4:05 p.m.	40$_4$	32 21.0	117 21.1	27	14.20	2695	2562	2504	33.54
2438	4:15 p.m.	40$_4$	32 21.0	117 21.1	18	16.95	...	...	...	.....
2439	4:15 p.m.	40$_4$	32 21.0	117 21.1	9	17.75	2704	2571	2432	33.65
2440	4:15 p.m.	40$_4$	32 21.0	117 21.1	0	18.1	2711	2577	2431	33.74
2441	4:35 p.m.	40$_4$	32 21.6	117 20.2	92	9.80	...	...	...	.....
2442	4:35 p.m.	40$_4$	32 21.6	117 20.2	55	11.20	2703	2570	2569	33.64
2443	4:45 p.m.	40$_4$	32 21.6	117 20.2	37	11.95	...	...	...	.....
2444	4:45 p.m.	40$_4$	32 21.6	117 20.2	27	13.65	2693	2560	2514	33.52
2445	4:55 p.m.	40$_4$	32 21.6	117 20.2	18	15.45	...	...	...	.....
2446	4:55 p.m.	40$_4$	32 21.6	117 20.2	9	17.60	2702	2569	2434	33.63
2447	4:55 p.m.	40$_4$	32 21.6	117 20.2	0	18.1	...	...	...	.....
2448	5:05 p.m.	40$_{4.5}$	32 22.5	117 19.2	92	9.90	...	...	...	.....
2449	5:05 p.m.	40$_{4.5}$	32 22.5	117 19.2	55	10.70	2698	2565	2574	33.58
2450	5:15 p.m.	40$_{4.5}$	32 22.5	117 19.2	37	11.95	...	...	...	.....
2451	5:15 p.m.	40$_{4.5}$	32 22.5	117 19.2	27	13.00	2689	2556	2523	33.47
2452	5:25 p.m.	40$_{4.5}$	32 22.5	117 19.2	18	16.50	...	...	...	.....
2453	5:25 p.m.	40$_{4.5}$	32 22.5	117 19.2	9	17.75	2702	2569	2429	33.63
2454	5:25 p.m.	40$_{4.5}$	32 22.5	117 19.2	0	18.15	2722	2588	2439	33.88
				June 28, 1911						
2455	6:00 a.m.	39$_4$	32 24.7	117 15.6	27	12.70	...	...	...	.....
2456	6:00 a.m.	39$_4$	32 24.7	117 15.6	18	13.70	2698	2565	2518	33.58
2457	6:10 a.m.	39$_4$	32 24.7	117 15.6	9	17.80	...	...	.....	.....
2458	6:10 a.m.	39$_4$	32 24.7	117 15.6	0	17.8	2716	2582	2443	33.80

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position		Depth in meters	Temperature in centigrade	Specific gravity			Salinity S ‰
			North latitude	West longitude			0° S/4°0	17°5 S/17°5	t° S/4°0	
			June 28, 1911							
2459	6:30 a.m.	39_5	32° 24.2	117° 16.4	82	9°95	.....	.....	.....	.....
2460	6:30 a.m.	39_5	32 24.2	117 16.4	55	10.20	2710	2576	2595	33.73
2461	6:40 a.m.	39_4	32 24.2	117 16.4	37	10.2?	.....	.....	.....	.....
2462	6:40 a.m.	39_3	32 24.2	117 16.4	27	12.30	2694	2561	2540	33.53
2463	6:40 a.m.	39_2	32 24.2	117 16.4	0	18.1	2712	2578	2432	33.75
2464	6:45 a.m.	39_5	32 24.2	117 16.4	18	14.60	.....	.....	.....	.....
2465	6:45 a.m.	39_5	32 24.2	117 16.4	9	18.10	2705	2572	2425	33.66
2466	7:00 a.m.	39_5	32 23.8	117 16.7	92	9.85	.....	.....	.....	.....
2467	7:00 a.m.	39_5	32 23.8	117 16.7	55	10.20	2710	2576	2596	33.73
2468	7:07 a.m.	39_5	32 23.8	117 16.7	37	10.80	.....	.....	.....	.....
2469	7:07 a.m.	39_4	32 23.8	117 16.7	27	12.40	2691	2558	2533	33.49
2470	7:12 a.m.	39_3	32 23.8	117 16.7	18	15.00	.....	.....	.....	.....
2471	7:12 a.m.	39_5	32 23.8	117 16.7	9	18.00	2706	2573	2428	33.68
2472	7:12 a.m.	39_5	32 23.8	117 16.7	0	18.0	2706	2573	2428	33.68
2473	7:35 a.m.	39.5_5	32 23.6	117 17.5	92	9.90	.....	.....	.....	.....
2474	7:35 a.m.	39.5_5	32 23.6	117 17.5	55	10.10	2709	2575	2595	33.71
2475	7:42 a.m.	39.5_5	32 23.6	117 17.5	37	11.60	.....	.....	.....	.....
2476	7:42 a.m.	39.5_3	32 23.6	117 17.5	27	13.90	2700	2567	2516	33.60
2477	7:47 a.m.	39.5_5	32 23.6	117 17.5	18	16.65	.....	.....	.....	.....
2478	7:47 a.m.	39.5_5	32 23.6	117 17.5	9	18.15	2704	2571	2421	33.65
2479	7:47 a.m.	39.5_5	32 23.6	117 17.5	0	18.1	2710	2576	2430	33.73
2480	8:08 a.m.	40_5	32 23.0	117 18.5	92	9.90	.....	.....	.....	.....
2481	8:08 a.m.	40_5	32 23.0	117 18.5	55	10.80	2699	2566	2574	33.59
2482	8:12 a.m.	40_5	32 23.0	117 18.5	37	11.45	.....	.....	.....	.....
2483	8:12 a.m.	40_3	32 23.0	117 18.5	27	13.50	2695	2562	2517	33.54
2484	8:15 a.m.	40_5	32 23.0	117 18.5	18	15.50	.....	.....	.....	.....
2485	8:15 a.m.	40_5	32 23.0	117 18.5	9	17.95	2702	2569	2426	33.63
2486	8:15 a.m.	40_5	32 23.0	117 18.5	0	18.0	2700	2567	2423	33.60
2487	9:00 a.m.	40_5	32 26.5	117 18.5	64	10.25	.....	.....	.....	.....
2488	9:00 a.m.	40_5	32 26.5	117 18.5	55	10.?5	2704	2571	2580	33.65
2489	9:05 a.m.	40_5	32 26.5	117 18.5	37	11.45	.....	.....	.....	.....
2490	9:05 a.m.	40_3	32 26.5	117 18.5	27	14.70	2698	2565	2496	33.58
2491	9:10 a.m.	40_5	32 26.5	117 18.5	18	16.65	.....	.....	.....	.....
2492	9:10 a.m.	40_5	32 26.5	117 18.5	9	17.95	2706	2573	2428	33.68
2493	9:10 a.m.	40_5	32 26.5	117 18.5	0	18.1	2713	2579	2433	33.76
2494	9:20 a.m.	40_5	32 26.1	117 19.0	82	10.05	.....	.....	.....	.....
2495	9:20 a.m.	40_5	32 26.1	117 19.0	55	10.50	2702	2569	2583	33.63
2496	9:26 a.m.	40_5	32 26.1	117 19.0	37	12.55	.....	.....	.....	.....
2497	9:26 a.m.	40_3	32 26.1	117 19.0	27	15.50	2692	2559	2474	33.50
2498	9:30 a.m.	40_5	32 26.1	117 19.0	18	17.60	.....	.....	.....	.....
2499	9:30 a.m.	40_5	32 26.1	117 19.0	9	18.00	2703	2570	2425	33.64
2500	9:30 a.m.	40_5	32 26.1	117 19.0	0	18.15	2705	2572	2425	33.66
2501	9:50 a.m.	40_5	32 25.7	117 19.5	92	10.00	.....	.....	.....	.....
2502	9:50 a.m.	40_5	32 25.7	117 19.5	55	10.80	2700	2567	2574	33.60
2503	9:56 a.m.	40_5	32 25.7	117 19.5	37	12.50	.....	.....	.....	.....
2504	9:56 a.m.	40_3	32 25.7	117 19.5	27	14.60	2698	2565	2499	33.58
2505	10:00 a.m.	40_5	32 25.7	117 19.5	18	17.20	.....	.....	.....	.....
2506	10:00 a.m.	40_5	32 25.7	117 19.5	9	18.05	2708	2574	2431	33.70
2507	10:00 a.m.	40_5	32 25.7	117 19.5	0	18.2	2708	2574	2425	33.70
2508	10:20 a.m.	40_5	32 25.3	117 20.0	92	9.90	.....	.....	.....	.....
2509	10:20 a.m.	40_5	32 25.3	117 20.0	55	11.10	2700	2567	2568	33.60
2510	10:25 a.m.	40_5	32 25.3	117 20.0	37	12.65	.....	.....	.....	.....
2511	10:25 a.m.	40_3	32 25.3	117 20.0	27	14.70	2699	2566	2496	33.59
2512	10:30 a.m.	40_5	32 25.3	117 20.0	18	17.20	.....	.....	.....	.....
2513	10:30 a.m.	40_5	32 25.3	117 20.0	9	18.00	2709	2575	2431	33.71
2514	10:30 a.m.	40_5	32 25.3	117 20.0	0	18.2	2709	2575	2426	33.71
2515	10:45 a.m.	40_5	32 24.7	117 20.8	92	9.95	.....	.....	.....	.....
2516	10:45 a.m.	40_5	32 24.7	117 20.8	55	11.60	2691	2558	2552	33.49
2517	10:55 a.m.	40_5	32 24.7	117 20.8	37	12.85	.....	.....	.....	.....
2518	10:55 a.m.	40_3	32 24.7	117 20.8	27	14.45	2693	2560	2497	33.52
2519	11:00 a.m.	40_5	32 24.7	117 20.8	18	16.70	.....	.....	.....	.....
2520	11:00 a.m.	40_5	32 24.7	117 20.8	9	18.00	.....	.....	.....	.....
2521	11:00 a.m.	40_5	32 24.7	117 20.8	0	18.2	2705	2572	2421	33.66
2522	11:20 a.m.	40_5	32 24.2	117 21.8	92	9.85	2704	2571	2595	33.65

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° S / 4°0	Specific gravity: 17°5 S / 17°5	Specific gravity: t° S / 4°0	Salinity S ‰
				June 28, 1911						
2523	11:20 a.m.	40_5	32° 24'2	117° 21'8	55	11°35	2698	2565	2562	33.58
2524	11:30 a.m.	40_5	32 24.2	117 21.8	37	13.10	.....	.....	.....	.....
2525	11:30 a.m.	40_5	32 24.2	117 21.8	27	14.10	2696	2563	2507	33.55
2526	11:40 a.m.	40_5	32 24.2	117 21.8	18	16.85	.....	.....	.....	.....
2527	11:40 a.m.	40_5	32 24.2	117 21.8	9	17.90	2701	2568	2424	33.61
2528	11:40 a.m.	40_5	32 24.2	117 21.8	0	18.0	2708	2574	2430	33.70
2529	12:50 p.m.	41_5	32 22.9	117 23.6	92	10.40	.....	.....	.....	.....
2530	12:50 p.m.	41_5	32 22.9	117 23.6	55	11.70	2695	2562	2553	33.54
2531	12:55 p.m.	41_5	32 22.9	117 23.6	37	13.40	.....	.....	.....	.....
2532	12:55 p.m.	41_5	32 22.9	117 23.6	27	15.10	2701	2568	2491	33.61
2533	1:00 p.m.	41_5	32 22.9	117 23.6	18	17.00	.....	.....	.....	.....
2534	1:00 p.m.	41_5	32 22.9	117 23.6	9	17.75	.....	.....	.....	.....
2535	1:00 p.m.	41_5	32 22.9	117 23.6	0	17.8	2709	2576	2436	33.71
2536	1:05 p.m.	41_5	32 22.9	117 23.6	185	8.70	.....	.....	.....	.....
2537	1:05 p.m.	41_5	32 22.9	117 23.6	137	9.35	2718	2584	2617	33.83
2538	1:48 p.m.	41_4	32 21.6	117 25.4	92	10.40	.....	.....	.....	.....
2539	1:48 p.m.	41_4	32 21.6	117 25.4	55	12.00	2694	2561	2547	33.53
2540	1:55 p.m.	41_4	32 21.6	117 25.4	37	13.80	.....	.....	.....	.....
2541	1:55 p.m.	41_4	32 21.6	117 25.4	27	14.75	2698	2565	2494	33.58
2542	2:00 p.m.	41_4	32 21.6	117 25.4	18	16.60	.....	.....	.....	.....
2543	2:00 p.m.	41_4	32 21.6	117 25.4	9	17.55	2703	2570	2436	33.64
2544	2:00 p.m.	41_4	32 21.6	117 25.4	0	17.6	2706	2573	2438	33.68
2545	2:04 p.m.	41_4	32 21.6	117 25.4	185	8.65	.....	.....	.....	.....
2546	2:04 p.m.	41_4	32 21.6	117 25.4	137	9.50	2718	2584	2615	33.83
				June 29, 1911						
2547	6:35 a.m.	41_5	32 26.6	117 25.6	185	8.70	.....	.....	.....	.....
2548	6:35 a.m.	41_5	32 26.6	117 25.6	137	9.50	2721	2587	2617	33.86
2549	6:45 a.m.	41_5	32 26.6	117 25.6	92	10.30	.....	.....	.....	.....
2550	6:45 a.m.	41_5	32 26.6	117 25.6	55	12.00	2695	2562	2547	33.54
2551	6:50 a.m.	41_5	32 26.6	117 25.6	37	13.45	.....	.....	.....	.....
2552	6:50 a.m.	41_5	32 26.6	117 25.6	27	14.90	2693	2560	2488	33.52
2553	6:55 a.m.	41_5	32 26.6	117 25.6	18	16.15	.....	.....	.....	.....
2554	6:55 a.m.	41_5	32 26.6	117 25.6	9	17.25	2701	2568	2440	33.61
2555	6:55 a.m.	41_5	32 26.6	117 25.6	0	17.2	2708	2574	2448	33.70
2556	7:35 a.m.	41_6	32 29.0	117 23.4	92	10.60	.....	.....	.....	.....
2557	7:35 a.m.	41_6	32 29.0	117 23.4	55	12.15	2691	2558	2540	33.49
2558	7:40 a.m.	41_6	32 29.0	117 23.4	37	12.80	.....	.....	.....	.....
2559	7:40 a.m.	41_6	32 29.0	117 23.4	27	14.90	2699	2566	2493	33.59
2560	7:45 a.m.	41_6	32 29.0	117 23.4	18	17.25	.....	.....	.....	.....
2561	7:45 a.m.	41_6	32 29.0	117 23.4	9	17.25	2701	2568	2440	33.61
2562	7:50 a.m.	41_6	32 29.0	117 23.4	0	17.2	2707	2574	2447	33.69
2563	7:50 a.m.	41_6	32 29.0	117 23.4	185	8.75	.....	.....	.....	.....
2564	7:50 a.m.	41_6	32 29.0	117 23.4	137	9.30	2715	2581	2614	33.79
2565	8:15 a.m.	40_6	32 30.6	117 21.9	185	9.55	.....	.....	.....	.....
2566	8:15 a.m.	40_6	32 30.6	117 21.9	137	9.70	2725	2590	2616	33.91
2567	8:22 a.m.	40_6	32 30.6	117 21.9	92	10.10	.....	.....	.....	.....
2568	8:22 a.m.	40_6	32 30.6	117 21.9	55	11.10	2713	2579	2582	33.76
2569	8:30 a.m.	40_6	32 30.6	117 21.9	37	13.00	.....	.....	.....	.....
2570	8:30 a.m.	40_6	32 30.6	117 21.9	27	14.85	2700	2567	2495	33.60
2571	8:35 a.m.	40_6	32 30.6	117 21.9	18	16.90	.....	.....	.....	.....
2572	8:35 a.m.	40_6	32 30.6	117 21.9	9	17.45	2704	2571	2439	33.65
2573	8:35 a.m.	40_6	32 30.6	117 21.9	0	17.35	2701	2568	2438	33.61
2574	8:53 a.m.	40_6	32 32.3	117 20.4	185	9.40	.....	.....	.....	.....
2575	8:53 a.m.	40_6	32 32.3	117 20.4	137	9.75	2728	2593	2620	33.95
2576	9:00 a.m.	40_6	32 32.3	117 20.4	92	10.00	.....	.....	.....	.....
2577	9:00 a.m.	40_6	32 32.3	117 20.4	55	10.95	2695	2562	2567	33.54
2578	9:12 a.m.	40_6	32 32.3	117 20.4	37	12.05	.....	.....	.....	.....
2579	9:12 a.m.	40_6	32 32.3	117 20.4	27	13.20	2695	2562	2523	33.54
2580	9:18 a.m.	40_6	32 32.3	117 20.4	18	16.05	.....	.....	.....	.....
2581	9:18 a.m.	40_6	32 32.3	117 20.4	9	17.75	2700	2567	2429	33.60
2582	9:18 a.m.	40_6	32 32.3	117 20.4	0	17.8	2704	2571	2431	33.65
2583	9:35 a.m.	40_7	32 33.2	117 19.4	137	9.50	2706	2573	2603	33.68
2584	9:35 a.m.	40_7	32 33.2	117 19.4	92	9.90	.....	.....	.....	.....
2585	9:40 a.m.	40_7	32 33.2	117 19.4	55	10.55	.....	.....	.....	.....
2586	9:40 a.m.	40_7	32 33.2	117 19.4	37	12.90	2686	2553	2522	33.43

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° S	Specific gravity: 17°.5 S	Specific gravity: 4°.0 S	Salinity ‰
			June 29, 1911							
2587	9:45 a.m.	40,	32° 33.2	117° 19.4	27	13°.70	.....	.....	.....	.....
2588	9:45 a.m.	40,	32 33.2	117 19.4	9	18.15	2709	2575	2428	33.71
2589	9:50 a.m.	40,	32 33.2	117 19.4	18	16.60	2693	2560	2448	33.52
2590	9:50 a.m.	40,	32 33.2	117 19.4	0	18.05	2705	2572	2426	33.66
2591	10:15 a.m.	40,	32 34.1	117 18.6	92	9.85	.....	.....	.....	.....
2592	10:15 a.m.	40,	32 34.1	117 18.6	55	11.55	2702	2569	2562	33.63
2593	10:25 a.m.	40,	32 34.1	117 18.6	37	12.60	.....	.....	.....	.....
2594	10:25 a.m.	40,	32 34.1	117 18.6	27	14.95	2702	2569	2494	33.63
2595	10:30 a.m.	40,	32 34.1	117 18.6	18	17.80	.....	.....	.....	.....
2596	10:30 a.m.	40,	32 34.1	117 18.6	9	18.10	2701	2568	2421	33.61
2597	10:30 a.m.	40,	32 34.1	117 18.6	0	18.0	2705	2572	2427	33.66
2598	10:45 a.m.	40,	32 34.8	117 17.8	92	9.70	.....	.....	.....	.....
2599	10:45 a.m.	40,	32 34.8	117 17.8	55	10.80	2697	2564	2514	33.57
2600	10:50 a.m.	40,	32 34.8	117 17.8	37	11.00	.....	.....	.....	.....
2601	10:50 a.m.	40,	32 34.8	117 17.8	27	12.30	2693	2560	2539	33.52
2502	10:55 a.m.	40,	32 34.8	117 17.8	18	16.25	.....	.....	.....	.....
2603	10:55 a.m.	40,	32 34.8	117 17.8	9	18.30	2714	2580	2429	33.78
2604	10:55 a.m.	40,	32 34.8	117 17.8	0	18.15	2704	2571	2423	33.65
2605	11:20 a.m.	39,	32 36.7	117 16.1	46	10.95	.....	.....	.....	.....
2606	11:20 a.m.	39,	32 36.7	117 16.1	27	11.75	2697	2564	2554	33.57
2607	11:25 a.m.	39,	32 36.7	117 16.1	18	13.00	.....	.....	.....	.....
2608	11:25 a.m.	39,	32 36.7	117 16.1	9	17.20	2708	2574	2448	33.70
2609	11:25 a.m.	39,	32 36.7	117 16.1	0	17.2	2704	2571	2444	33.65
2610	11:50 a.m.	93,	32 37.4	117 14.6	27	11.40	.....	.....	.....	.....
2611	11:50 a.m.	39,	32 37.4	117 14.6	18	12.50	2696	2563	2538	33.55
2612	11:55 a.m.	39,	32 37.4	117 14.6	9	16.55	.....	.....	.....	.....
2613	11:55 a.m.	39,	32 37.4	117 14.6	5	17.45	2707	2574	2442	33.69
2614	11:55 a.m.	39,	32 37.4	117 14.6	0	17.7	2714	2580	2443	33.78
2615	12:36 p.m.	B	32 42.14	117 13.95	0	17.7	2713	2579	2442	33.76
2616	12:40 p.m.	B	32 42.6	117 12.9	0	17.75	2707	2574	2435	33.69
2617	12:44 p.m.	B	32 42.9	117 12.9	0	18.0	2708	2574	2430	33.70
2618	12:48 p.m.	B	32 43.0	117 12.2	0	18.2	2711	2577	2428	33.74
2619	12:52 p.m.	B	32 42.9	117 11.6	0	18.45	2713	2579	2424	33.76
2620	1:05 p.m.	B	32 42.4	117 10.3	0	18.4	2714	2580	2425	33.78
			Aug. 8, 1911							
2621	4:15 a.m.	40,	32 22.3	117 17.9	0	19.8	.....	.....	.....	.....
2622	5:10 a.m.	40,	32 22.3	117 17.9	0	19.8	.....	.....	.....	.....
2623	6:10 a.m.	40,	32 23.5	117 18.0	0	19.4	2717	2583	2404	33.812
2624	6:55 a.m.	40,	32 23.5	117 18.0	0	19.75	.....	.....	.....	.....
2625	7:20 a.m.	40,	32 23.5	117 18.0	0	19.75	.....	.....	.....	.....
2626	8:30 a.m.	39,	32 22.8	117 17.3	0	19.95	2702	2569	2374	33.63
2627	8:45 a.m.	40,	32 23.5	117 18.0	174	9.90	.....	.....	.....	.....
2628	8:45 a.m.	40,	32 23.5	117 18.0	82	10.65	2704	2571	2581	33.65
2629	9:00 a.m.	40,	From 8:45 to 10:02		137	10.05	2722	2588	2608	33.88
2630	9:00 a.m.	40,	a.m. the boat		64	11.10	2705	2572	2574	33.66
2631	9:10 a.m.	40,	drifted from the		101	10.25	.....	.....	.....	.....
2632	9:10 a.m.	40,	above position		46	11.75	2691	2558	2548	33.49
2633	9:19 a.m.	40,	to the following		64	10.90	2701	2568	2574	33.61
2634	9:19 a.m.	40,	position		27	13.55	2696	2563	2518	33.55
2635	9:25 a.m.	40,			41	11.65	2694	2561	2553	33.53
2636	9:25 a.m.	40,			18	14.35	2685	2552	2492	33.42
2637	9:32 a.m.	39,			27	13.75	2684	2552	2503	33.40
2638	9:32 a.m.	39,			11	17.55	2692	2559	2425	33.50
2639	9:38 a.m.	39,			16	15.90	2691	2558	2463	33.49
2640	9:38 a.m.	39,			7	19.90	2709	2575	2383	33.71
2641	9:42 a.m.	39,			9	19.00	2685	2552	2381	33.42
2642	9:42 a.m.	39,			4	20.05	.....	.....	.....	.....
2643	9:50 a.m.	39,			0	20.1	.....	.....	.....	.....
2644	9:55 a.m.	39,			92	10.20	2709	2575	2594	33.71
2645	9:55 a.m.	39,	32 22.8	117 17.0	82	10.75	.....	.....	.....	.....
2649	10:25 a.m.	40,	32 23.4	117 17.8	46	11.05	.....	.....	.....	.....
2650	10:35 a.m.	40,	32 23.2	117 17.6	37	11.50	.....	.....	.....	.....
2651	10:35 a.m.	40,	32 23.2	117 17.6	27	12.20	.....	.....	.....	.....
2652	10:40 a.m.	39.5,	32 23.2	117 17.5	0	20.4	2709	2575	2369	33.71

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° S 4°0	Specific gravity: 17°5 S 17°5	Specific gravity: t° S 4°0	Salinity S ‰
				Aug. 9, 1911						
2653	3:35 a.m.	40,	32° 22?7	117° 19?2	0	19?95	2715	2581	2387	33.79
2654	4:25 a.m.	40,	32 21.5	117 18.8	0	19.85	2700	2567	2375	33.60
2655	4:50 a.m.	40,	32 22.7	117 19.2	0	20.0	.....	.....	.....	.....
2656	5:43 a.m.	40,	From 4:45 to 7:08		137	9.90	2719	2585	2608	33.84
2657	5:43 a.m.	40,	a.m. the boat		110	10.10	2706	2573	2592	33.68
2658	5:48 a.m.	40,	drifted from the		0	20.0	2706	2573	2377	33.68
2659	5:55 a.m.	40,	above position		92	10.10	2703	2570	2589	33.64
2660	5:55 a.m.	40,	to the following		82	10.60	2701	2568	2579	33.61
2661	6:05 a.m.	40,	position		73	10.70	.....	.....	.....	.....
2662	6:05 a.m.	40,			64	11.45	2700	2567	2563	33.60
2663	6:08 a.m.	40,			55	11.55	2692	2559	2553	33.50
2664	6:08 a.m.	40,			46	11.75	2689	2556	2546	33.47
2665	6:15 a.m.	40,			37	12.00	2707	2574	2559	33.69
2666	6:15 a.m.	40,			27	12.65	2697	2564	2536	33.57
2667	6:20 a.m.	40,			23	12.85	2698	2565	2533	33.58
2668	6:20 a.m.	40,			18	13.65	2685	2552	2506	33.42
2669	6:25 a.m.	40,			16	13.80	2692	2559	2509	33.50
2670	6:25 a.m.	40,			11	19.35	2721	2587	2408	33.86
2671	6:30 a.m.	40,			9	19.95	2694	2561	2366	33.53
2672	6:30 a.m.	40,			7	20.00	2705	2572	2376	33.66
2673	6:35 a.m.	40,			6	20.10	2698	2565	2366	33.58
2674	6:35 a.m.	40,			4	20.15	2707	2574	2374	33.69
2675	6:35 a.m.	40,	32 22.4	117 18.5	0	20.0	2709	2575	2380	33.71
2676	7:17 a.m.	40,	32 22.7	117 19.2	0	19.6	2703	2570	2384	33.64
2677	8:10 a.m.	40,	32 22.4	117 18.5	0	20.05	2705	2572	2375	33.66
2678	9:20 a.m.	40,	32 22.3	117 20.2	0	20.15	2703	2570	2370	33.64
				Aug. 10, 1911						
2679	3:45 a.m.	40,	32 22.4	117 21.2	0	20.8	2719	2585	2367	33.84
2680	4:52 a.m.	40,	32 21.3	117 21.5	0	20.65	2705	2572	2358	33.66
2681	6:00 a.m.	40,	32 22.5	117 20.5	0	20.7	2713	2579	2365	33.76
2682	6:10 a.m.	40,	32 22.4	117 21.2	137	9.80	2727	2592	2618	33.94
2683	6:10 a.m.	40,	From 6:07 to 7:57		110	10.00	2709	2575	2597	33.71
2684	6:23 a.m.	40,	a.m. the boat		92	10.40	2702	2569	2583	33.63
2685	6:23 a.m.	40,	drifted from the		82	10.80	.....	.....	.....	.....
2686	6:30 a.m.	40,	above position		9	20.70	.....	.....	.....	.....
2687	6:30 a.m.	40,	to the following		64	11.35	2693	2560	2558	33.52
2688	7:03 a.m.	40,	position		55	11.95	2687	2554	2540	33.44
2689	7:03 a.m.	40,			46	12.50	2686	2553	2528	33.43
2690	7:12 a.m.	40,			37	13.30	2693	2560	2520	33.52
2691	7:12 a.m.	40,			27	14.35	2686	2553	2492	33.43
2692	7:30 a.m.	40,			23	15.30	2686	2553	2471	33.43
2693	7:40 a.m.	40,			5	20.65	.....	.....	.....	.....
2694	7:40 a.m.	40,			18	16.55	2689	2556	2445	33.47
2695	7:43 a.m.	40,			16	17.50	.....	.....	.....	.....
2696	7:43 a.m.	40,			11	20.65	2703	2570	2357	33.64
2697	7:46 a.m.	40,			9	20.70	2701	2568	2353	33.61
2698	7:46 a.m.	40,			7	20.75	2700	2567	2350	33.60
2699	7:51 a.m.	40,			5	20.75	2699	2566	2349	33.59
2700	7:51 a.m.	40,			4	20.75	2687	2554	2338	33.44
2701	7:53 a.m.	40,	32 23.3	117 20.0	0	20.6	2702	2569	2357	33.63
2702	9:46 a.m.	41,	32 18.7	117 24.5	0	20.15	2706	2573	2373	33.68
2703	10:27 a.m.	41,	32 18.2	117 24.7	1420	3.40	.....	.....	.....	.....
2704	10:27 a.m.	41,	From 10:15 a.m. to		1370	3.45	2772	2635	2747	34.50
2705	11:20 a.m.	41,	1:55 p.m. the boat		1100	4.95	.....	.....	.....	.....
2706	11:20 a.m.	41,	drifted from the		730	6.20	2752	2616	2695	34.25
2707	12:47 p.m.	41,	above position		0	19.8	2705	2572	2381	33.66
2708	12:50 p.m.	41,	to the following		185	10.05	2712	2578	2599	33.75
2709	12:50 p.m.	41,	position		137	10.10	.....	.....	.....	.....
2711	1:00 p.m.	41,			185	10.10	2714	2580	2600	33.78
2712	1:15 p.m.	41,			110	10.10	2704	2571	2590	33.65
2713	1:15 p.m.	41,			92	10.60	2701	2568	2579	33.61
2714	1:25 p.m.	41,			73	10.70	2695	2562	2571	33.54
2715	1:25 p.m.	41,			55	11.75	2696	2563	2553	33.55

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: S 0°/4°	Specific gravity: S 17.5°/17.5°	Specific gravity: S t°/4°	Salinity S ‰
				Aug. 10, 1911						
2716	1:34 p.m.	41$_4$			46	12.10	2694	2561	2544	33.53
2717	1:34 p.m.	41$_4$			37	13.35	....	....	....	....
2718	1:40 p.m.	41$_4$			27	15.10	.....	.....	.....	
2719	1:40 p.m.	41$_4$			23	17.05	2690	2557	2435	33.48
2720	1:43 p.m.	41$_4$			18	18.00	.....	.....	.....	....
2721	1:43 p.m.	41$_4$			14	18.80	2719	2585	2422	33.84
2722	1:48 p.m.	41$_4$	32° 19.1	117° 24.3	0	20.2	2703	2570	2369	33.64
				Aug. 11, 1911						
2723	6:00 a.m.	40$_4$	32 20.6	117 21.3	0	20.4	2717	2583	2377	33.81
2724	6:50 a.m.	40$_4$	32 20.9	117 21.1	1280	3.95	....	....	....	....
2725	6:50 a.m.	40$_4$	32 20.9	117 21.1	1235	4.05	2766	2630	2734	34.42
2726	7:48 a.m.	40$_4$	32 20.5	117 21.2	0	20.15	2706	2573	2373	33.68
2727	7:56 a.m.	40$_4$	32 20.9	117 21.1	825	5.20	....	....	....	....
2728	7:56 a.m.	40$_4$	32 20.9	117 21.1	550	6.15	2743	2608	2683	34.14
2729	8:30 a.m.	40$_4$	From 7:56 to 9:15		365	8.70	....	....	....	....
2730	8:30 a.m.	40$_4$	a.m. the boat		275	9.20	2732	2597	2633	34.00
2731	8:52 a.m.	40$_4$	drifted from the		185	9.70	....	....	....	....
2732	8:52 a.m.	40$_4$	above position		137	9.90	....	....	....	....
2733	9:05 a.m.	40$_4$	to the following		110	10.05	....	....	....	....
2734	9:05 a.m.	40$_4$	position		92	10.40	2704	2571	2585	33.65
2735	9:15 a.m.	40$_4$	32 20.0	117 20.5	0	20.5	2705	2572	2362	33.66
2736	9:30 a.m.	40$_4$	32 20.9	117 21.1	73	10.95	2697	2564	2569	33.57
2737	9:30 a.m.	40$_4$	32 20.9	117 21.1	55	11.50	2692	2559	2554	33.50
2738	9:40 a.m.	40$_4$	From 9:27 to 10:00		46	12.25	2692	2559	2539	33.50
2739	9:40 a.m.	40$_4$	a.m. the boat		37	13.90	2697	2564	2512	33.57
2740	9:45 a.m.	40$_4$	drifted from the		27	15.10	....	....	....	....
2741	9:45 a.m.	40$_4$	above position		18	16.90	2694	2561	2442	33.53
2742	9:53 a.m.	40$_4$	to the following		23	15.40	2713	2579	2496	33.76
2743	9:53 a.m.	40$_4$	position		14	17.40	2695	2562	2431	33.54
2744	9:58 a.m.	40$_4$	32 20.6	117 20.6	9	20.20	2700	2567	2366	33.60
2745	10:53 a.m.	40$_4$	32 22.7	117 19.2	460	7.70	....	....	....	....
2746	10:53 a.m.	40$_4$	32 22.7	117 19.2	365	8.50	2748	2612	2658	34.20
2747	11:15 a.m.	40$_4$	From 10:40 a.m. to		275	9.70	....	....	....	....
2748	11:15 a.m.	40$_4$	12:15 p.m. the boat		185	9.80	2723	2588	2614	33.89
2749	11:34 a.m.	40$_4$	drifted from the		137	9.80	2718	2584	2610	33.83
2750	11:34 a.m.	40$_4$	above position		110	10.30	2695	2562	2578	33.54
2751	11:46 a.m.	40$_4$	to the following		92	10.45	2699	2566	2579	33.59
2752	11:46 a.m.	40$_4$	position		73	11.10	2694	2561	2563	33.53
2753	11:55 a.m.	40$_4$			55	11.40	2696	2563	2560	33.55
2754	11:55 a.m.	40$_4$			46	12.80	2691	2558	2527	33.49
2755	11:58 a.m.	40$_4$			0	20.75	2706	2573	2357	33.68
2756	12:03 p.m.	40$_4$			37	13.50	....	....	....	....
2757	12:03 p.m.	40$_4$			27	15.80	2701	2568	2475	33.61
2758	12:07 p.m.	40$_4$			23	16.10	2695	2562	2462	33.54
2759	12:07 p.m.	40$_4$			14	19.40	2701	2568	2388	33.61
2760	12:12 p.m.	40$_4$			18	17.00	2698	2565	2444	33.58
2761	12:12 p.m.	40$_4$	32 21.1	117 18.7	9	20.60	2707	2574	2362	33.69
2762	12:48 p.m.	39$_4$	32 23.5	117 17.4	9		2708	2574	....	33.70
2763	12:48 p.m.	39$_4$	32 23.5	117 17.4	101	10.40	2699	2566	2580	33.59
2764	12:59 p.m.	39	From 12:45 to 1:38		92	10.70	2704	2571	2580	33.65
2765	12:59 p.m.	39$_4$	p.m. the boat		82	10.85	2699	2566	2573	33.59
2766	1:05 p.m.	39$_4$	drifted from the		110	10.35	2698	2565	2580	33.58
2767	1:05 p.m.	39$_4$	above position		73	11.30	2701	2568	2566	33.61
2768	1:15 p.m.	39$_4$	to the following		55	11.80	2693	2560	2549	33.52
2769	1:15 p.m.	39$_4$	position		46	12.25	2688	2555	2537	33.45
2770	1:20 p.m.	39$_4$			37	12.90	2691	2558	2525	33.49
2771	1:20 p.m.	39$_4$			27	15.10	2691	2558	2481	33.49
2772	1:25 p.m.	39$_4$			0	20.1	2711	2577	2379	33.74
2773	1:27 p.m.	39$_4$			23	18.20	2703	2570	2420	33.64
2774	1:27 p.m.	39$_4$			14	20.70	2700	2567	2352	33.60
2775	1:32 p.m.	39$_4$			18	.....	2709	2575	.....	33.71
2776	1:32 p.m.	39$_4$	32 22.7	117 16.7	9	20.70	2701	2568	2351	33.61
2777	2:02 p.m.	39$_4$	32 23.9	117 17.0	82	10.60	.....	....	....	....

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: S 0°/4°0	Specific gravity: S 17°5/17°5	Specific gravity: S t°/4°0	Salinity S ‰
				Aug. 11, 1911						
2778	2:02 p.m.	39_5	32° 23.9	117° 17.0	73	10°.95	2698	2565	2570	33.58
2779	2:06 p.m.	39_4	From 1:58 to 2:25		55	11.35	2702	2569	2566	33.63
2780	2:06 p.m.	39_3	p.m. the boat		46	12.45	2687	2554	2530	33.44
2781	2:12 p.m.	39_2	drifted from the		37	13.45	2691	2558	2515	33.49
2782	2:12 p.m.	39_1	above position		27	15.40	2689	2556	2472	33.47
2783	2:18 p.m.	39_1	to the following		23	16.30	2691	2558	2453	33.49
2784	2:18 p.m.	39_2	position		14	20.20	2701	2568	2367	33.61
2785	2:23 p.m.	39_3			18	17.20	2695	2562	2436	33.54
2786	2:23 p.m.	39_4			9	20.50	2706	2573	2363	33.68
2787	2:25 p.m.	39_5	32 23.6	117 16.2	0	20.8	2709	2575	2358	33.71
2788	2:38 p.m.	39_5	32 24.2	117 16.5	64	11.00	2695	2562	2566	33.54
2789	2:38 p.m.	39_4	32 24.2	117 16.5	55	11.25	2693	2560	2559	33.52
2790	2:46 p.m.	39_4	From 2:37 to 3:08		46	11.95	2682	2550	2510	33.38
2791	2:46 p.m.	39_3	p.m. the boat		37	13.25	2682	2550	2510	33.38
2792	2:53 p.m.	39_3	drifted from the		27	14.50	2695	2562	2497	33.54
2793	2:53 p.m.	39_2	above position		18	16.40	2693	2560	2453	33.52
2794	2:58 p.m.	39_2	to the following		23	15.70	2694	2561	2471	33.53
2795	2:58 p.m.	39_1	position		14	18.70	2697	2564	2402	33.57
2796	3:00 p.m.	39_1			0	20.85	2705	2572	2353	33.66
2797	3:05 p.m.	39_2	32 23.0	117 16.0	9	.....	2702	2569	.....	33.63
				Aug. 12, 1911						
2798	4:40 a.m.	39_1	32 24.2	117 15.0	0	19.6	.....	.....	.....	.....
2799	4:45 a.m.	39_2	32 24.2	117 15.0	27	14.40	2686	2553	2490	33.43
2800	4:45 a.m.	39_3	32 24.2	117 15.0	18	16.25	2694	2561	2457	33.53
2801	4:53 a.m.	39_3	32 24.2	117 15.0	23	15.90	2687	2554	2459	33.44
2802	4:53 a.m.	39_2	32 24.2	117 15.0	14	18.85	2695	2562	2396	33.54
2803	4:58 a.m.	39_2	32 24.2	117 15.0	9	.....	2700	2567	.....	33.60
2804	5:12 a.m.	39_2	32 24.6	117 15.8	23	14.50	2684	2552	2486	33.40
2805	5:12 a.m.	39_3	32 24.6	117 15.8	14	19.70	2700	2567	2379	33.60
2806	5:14 a.m.	39_3	32 24.6	117 15.8	0	20.4	2703	2570	2363	33.64
2807	5:16 a.m.	39_2	32 24.6	117 15.8	9	20.15	2700	2567	2367	33.60
2808	6:55 a.m.	40_6	32 31.4	117 21.5	330	9.00	2729	2594	2633	33.96
2809	6:55 a.m.	40_6	32 31.4	117 21.5	185	9.90	2727	2592	2616	33.94
2810	7:15 a.m.	40_6	32 31.4	117 21.5	137	10.10	2708	2574	2594	33.70
2811	7:15 a.m.	40_6	32 31.4	117 21.5	110	10.15	2706	2573	2591	33.68
2812	7:25 a.m.	40_6	32 30.8	117 21.5	92	10.20	2693	2560	2578	33.52
2813	7:25 a.m.	40_6	32 30.8	117 21.5	73	11.10	2692	2559	2561	33.50
2814	7:33 a.m.	40_6	32 30.8	117 21.5	55	11.75	2686	2553	2544	33.43
2815	7:33 a.m.	40_6	32 30.8	117 21.5	46	12.35	2684	2552	2531	33.40
2816	7:40 a.m.	40_6	32 30.8	117 21.5	37	13.10	2683	2551	2515	33.39
2817	7:40 a.m.	40_6	32 30.8	117 21.5	27	14.10	2684	2552	2496	33.40
2818	7:42 a.m.	40_6	32 30.8	117 21.5	23	14.70	2686	2553	2485	33.43
2819	7:42 a.m.	40_6	32 30.8	117 21.5	14	16.45	2700	2567	2458	33.60
2820	7:50 a.m.	40_6	32 30.8	117 21.5	18	15.35	2686	2553	2470	33.43
2821	7:50 a.m.	40_6	32 30.8	117 21.5	9	18.45	2691	2558	2402	33.49
2822	7:52 a.m.	40_6	32 30.8	117 21.5	0	20.75	2703	2570	2354	33.64
2823	8:38 a.m.	40_7	32 32.6	117 20.2	110	10.70	2700	2567	2576	33.60
2824	8:38 a.m.	40_7	32 32.6	117 20.2	92	10.80	2701	2568	2575	33.61
2825	8:45 a.m.	40_7	32 32.6	117 20.2	73	11.10	2700	2567	2569	33.60
2826	8:45 a.m.	40_7	32 32.6	117 20.2	64	11.35	2698	2565	2562	33.58
2827	8:52 a.m.	40_7	32 32.6	117 20.2	46	12.00	2691	2558	2543	33.49
2828	8:52 a.m.	40_7	32 32.6	117 20.2	37	12.50	2696	2563	2538	33.55
2829	8:58 a.m.	40_7	32 32.6	117 20.2	27	13.40	2686	2553	2511	33.43
2830	8:58 a.m.	40_7	32 32.6	117 20.2	18	15.25	2689	2556	2476	33.47
2831	9:00 a.m.	40_7	32 32.6	117 20.2	0	20.8	2707	2574	2356	33.69
2832	9:03 a.m.	40_7	32 32.6	117 20.2	23	15.00	2692	2559	2484	33.50
2833	9:03 a.m.	40_7	32 32.6	117 20.2	14	16.50	2691	2558	2448	33.49
2834	9:07 a.m.	40_7	32 32.6	117 20.2	9	16.90	2692	2559	2440	33.50
2835	9:25 a.m.	40_6	32 31.9	117 20.5	575	7.05	.....	.....	.....	.....
2836	9:25 a.m.	40_6	32 31.9	117 20.5	365	8.65	2732	2616	2660	34.25
2837	9:55 a.m.	40_6	32 31.5	117 19.3	185	10.00	2727	2592	2614	33.94
2838	9:55 a.m.	40_6	32 31.5	117 19.3	92	10.60	2700	2567	2578	33.60
2839	10:07 a.m.	40_6	32 31.5	117 19.3	55	11.80	2692	2559	2549	33.50

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° S 4°0	Specific gravity: 17°5 S 17°5	Specific gravity: t° S 4°0	Salinity S ‰
				Aug. 12, 1911						
2840	10:07 a.m.	40_0	32° 31.5	117° 19.3	37	12°90	2682	2550	2518	33.38
2841	10:10 a.m.	40_0	32 31.5	117 19.3	0	20.1	2708	2574	2376	33.70
2842	10:13 a.m.	40_0	32 31.5	117 19.3	27	13.60	2684	2552	2506	33.40
2843	10:13 a.m.	40_0	32 31.5	117 19.3	18	15.75	2691	2558	2467	33.49
2844	10:18 a.m.	40_0	32 31.5	117 19.3	9	17.45	2690	2557	2425	33.48
2845	10:46 a.m.	40_7	32 33.6	117 18.0	110	10.30	2710	2576	2593	33.73
2846	10:46 a.m.	40_7	32 33.6	117 18.0	92	10.70	2702	2569	2578	33.63
2847	10:53 a.m.	40_7	32 33.6	117 18.0	73	11.00	2697	2564	2568	33.57
2848	10:53 a.m.	40_7	32 33.6	117 18.0	55	11.90	2692	2559	2546	33.50
2849	11:00 a.m.	40_7	32 33.6	117 18.0	46	12.30	2689	2556	2535	33.47
2850	11:00 a.m.	40_7	32 33.6	117 18.0	37	12.60	2686	2553	2526	33.43
2851	11:05 a.m.	40_7	32 33.6	117 18.0	27	13.30	2687	2554	2514	33.44
2852	11:05 a.m.	40_7	32 33.6	117 18.0	18	14.60	2686	2553	2486	33.43
2853	11:10 a.m.	40_7	32 33.6	117 18.0	14	16.00	2692	2559	2461	33.50
2854	11:10 a.m.	40_7	32 33.6	117 18.0	9	17.10	2704	2571	2440	33.65
2855	11:12 a.m.	40_7	32 33.6	117 18.0	0	21.2	2712	2578	2351	33.75
2856	11:30 a.m.	39_7	32 34.0	117 16.9	73	11.10	2692	2559	2561	33.50
2857	11:30 a.m.	39_7	32 34.0	117 16.9	55	11.75	2691	2558	2548	33.49
2858	11:40 a.m.	39_7	32 34.0	117 16.9	46	12.20	2688	2555	2536	33.45
2859	11:40 a.m.	39_7	32 34.0	117 16.9	37	12.95	2683	2551	2517	33.39
2860	11:41 a.m.	39_7	32 34.0	117 16.9	0	21.2	2710	2576	2349	33.73
2861	11:45 a.m.	39_7	32 34.0	117 16.9	27	13.10	2690	2557	2521	33.48
2862	11:45 a.m.	39_7	32 34.0	117 16.9	18	13.90	2683	2551	2498	33.39
2863	11:50 a.m.	39_7	32 34.0	117 16.9	23	13.80	2684	2552	2501	33.40
2864	11:50 a.m.	39_7	32 34.0	117 16.9	14	14.80	2692	2559	2488	33.50
2865	11:55 a.m.	39_7	32 34.0	117 16.9	9	17.05	2693	2560	2438	33.52
2866	12:32 p.m.	39_7	32 37.3	117 16.0	42	11.20	2704	2571	2571	33.65
2867	12:32 p.m.	39_7	32 37.3	117 16.0	33	12.00	2684	2552	2536	33.40
2868	12:38 p.m.	39_7	32 37.3	117 16.0	23	12.70	2699	2566	2537	33 59
2869	12:38 p.m.	39_7	32 37.3	117 16.0	14	13.75	2699	2566	2517	33.59
2870	12:40 p.m.	39_7	32 37.3	117 16.0	0	20.45	2695	2562	2354	33.54
2871	12:43 p.m.	39_7	32 37.3	117 16.0	18	12.90	2691	2558	2525	33.49
2872	12:43 p.m.	39_7	32 37.3	117 16.0	9	15.70	2699	2566	2476	33.59
2873	12:57 p.m.	39_7	32 37.1	117 14.9	27	12.10	2698	2565	2548	33.58
2874	12:57 p.m.	39_7	32 37.1	117 14.9	18	13.40	2701	2568	2526	33.61
2875	1:00 p.m.	39_7	32 37.1	117 14.9	23	12.20	2691	2558	2539	33.49
2876	1:00 p.m.	39_7	32 37.1	117 14.9	14	14.10	2688	2555	2499	33.45
2877	1:00 p.m.	39_7	32 37.1	117 14.9	0	20.0	2709	2575	2380	33.71
2878	1:05 p.m.	39_7	32 37.1	117 14.9	9	17.45	2695	2562	2430	33.54
				Aug. 15, 1911						
2879	6:00 a.m.	(40_{12})	33 1.0	117 18.3	0	21.75	.....	.....	.....	.....
2880	7:00 a.m.	$(40_{12.5})$	33 2.5	117 19.1	0	20.4	.....	.....	.....	.....
2881	10:00 a.m.	(41_{15})	33 14.0	117 26.6	0	20.2	.....	.....	.....	.....
				Aug. 17, 1911						
2882	6:00 a.m.	$61_{(25)}$	34 4.0	119 5.0	0	14.6	.....	.....	.....	.....
2883	6:30 a.m.	$61_{(25)}$	34 4.5	119 6.5	0	14.2	.....	.....	.....	.....
2884	7:00 a.m.	(62_{25})	34 5.5	119 11.0	0	15.0	.....	.....	.....	.....
2885	7:30 a.m.	(63_{26})	34 8.0	119 15.0	0	15.6	.....	.....	.....	.....
2886	9:30 a.m.	(65_{28})	34 17.7	119 24.4	0	18.0	.....	.....	.....	.....
2887	11:00 a.m.	(65.5_{28})	34 20.0	119 27.5	0	19.8	.....	.....	.....	.....
2888	12:01 p.m.	67_{28}	34 22.0	119 35.0	0	19.8	.....	.....	.....	.....
				Aug. 18, 1911						
2889	10:30 a.m.	$75_{(29)}$	34 26.0	120 15.0	0	18.4	.....	.....	.....	.....
2890	11:00 a.m.	$76_{(29)}$	34 25.0	120 17.7	0	17.4	.....	.....	.....	.....
2891	11:30 a.m.	$76_{(29)}$	34 25.0	120 22.0	0	16.6	.....	.....	.....	.....
2892	12:01 p.m.	$77_{(29)}$	34 25.0	120 25.0	0	15.8	.....	.....	.....	.....
2893	12:45 p.m.	$75_{(29)}$	34 26.0	120 15.0	0	18.75	.....	.....	.....	.....
				Aug. 19, 1911						
2894	8:25 a.m.	68_{28}	34 22.0	119 40.5	0	19.7	.....	.....	.....	.....
2895	11:00 a.m.	$66_{30.5}$	34 12.5	119 32.0	0	18.2	.....	.....	.....	.....
2896	2:20 p.m.	66_{24}	34 0.0	119 30.0	0	20.25	.....	.....	.....	.....
2897	2:35 p.m.	66_{24}	33 58.0	119 30.0	0	19.2	.....	.....	.....	.....
2898	6:30 p.m.	72_{24}	34 1.0	120 0.0	0	15.5	.....	.....	.....	.....
2899	6:45 p.m.	72_{24}	34 0.5	120 2.0	0	14.8	.....	.....	.....	.....

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position		Depth in meters	Temperature in centigrade	Specific gravity			Salinity S ‰
			North latitude	West longitude			0° / 4°0	17°5 / 17°5	t° / 4°0	
				Aug. 20, 1911						
2900	5:35 a.m.	72_{24}	34° 0.5	120° 2.0	0	14°6	....	.....	.... ..	.....
2901	5:45 a.m.	72_{24}	34 1.0	120 2.0	0	14.6	.....	.. ....	.....	.....
2902	5:55 a.m.	72_{24}	34 1.6	120 2.1	0	14.9	.....	.....	.....	.....
2903	1:15 p.m.	72_{0}	33 52.8	120 7.0	0	17.5	.....	.....	.....	.....
				Aug. 21, 1911						
2904	3:06 a.m.	74_{24}	33 53.0	120 9.1	24	12.80	2692	2559	2528	33.50
2905	3:06 a.m.	74_{24}	33 53.0	120 9.1	15	14.80	2706	2573	2502	33.68
2906	3:10 a.m.	74_{24}	33 53.0	120 9.1	0	15.4	2712	2578	2495	33.75
2907	3:15 a.m.	74_{24}	33 53.0	120 9.1	18	13.25	.... ..	.....	.....	.....
2908	3:15 a.m.	74_{24}	33 53.0	120 9.1	9	14.85	2692	2559	2487	33.50
2909	3:37 a.m.	74_{24}	33 53.2	120 10.2	110	9.35	2719	2585	2617	33.84
2910	3:37 a.m.	74_{24}	33 53.2	120 10.2	73	9.60	.....	.....	....	.....
2911	3:46 a.m.	74_{24}	33 53.2	120 10.2	55	10.55	2702	2569	2581	33.63
2912	3:46 a.m.	74_{24}	33 53.2	120 10.2	46	11.30	2696	2563	2561	33.55
2913	3:46 a.m.	74_{24}	33 53.2	120 10.2	0	16.4	2696	2563	2456	33.55
2914	3:55 a.m.	74_{24}	33 53.2	120 10.2	37	11.65	2690	2557	2549	33.48
2915	3:55 a.m.	74_{24}	33 53.2	120 10.2	27	12.00	2723	2588	2574	33.89
2916	4:01 a.m.	74_{24}	33 53.2	120 10.2	23	12.15	2720	2586	2568	33.85
2917	4:01 a.m.	74_{24}	33 53.2	120 10.2	14	14.15	2686	2553	2496	33.43
2918	4:07 a.m.	74_{24}	33 53.2	120 10.2	18	13.35	2685	2552	2511	33.42
2919	4:07 a.m.	74_{24}	33 53.2	120 10.2	9	15.95	2711	2577	2481	33.74
2920	4:28 a.m.	74_{24}	33 53.0	120 10.7	165	9.05	2718	2584	2621	33.83?
2921	4:28 a.m.	74_{24}	33 53.0	120 10.7	137	9.35	2743	2608	2641	34.14
2922	4:45 a.m.	74_{24}	33 53.0	120 10.7	110	9.75	2730	2595	2621	33.97
2923	4:45 a.m.	74_{24}	33 53.0	120 10.7	64	9.80	2709	2575	2601	33.71
2924	4:58 a.m.	74_{24}	33 53.0	120 10.7	46	10.70	2716	2582	2592	33.80
2925	4:58 a.m.	74_{24}	33 53.0	120 10.7	37	10.80	2696	2563	2570	33.55
2926	5:07 a.m.	74_{24}	33 53.0	120 10.7	27	11.75	2700	2567	2557	33.60
2927	5:25 a.m.	74_{24}	33 53.0	120 10.7	23	12.15	2703	2570	2552	33.64
2928	5:25 a.m.	74_{24}	33 53.0	120 10.7	14	15.55	2710	2576	2490	33.73
2929	5:30 a.m.	74_{24}	33 53.0	120 10.7	18	14.00	.... ..	.....	.... .	.....
2930	5:35 a.m.	74_{24}	33 53.0	120 10.7	0	16.6	2700	2567	2455	33.60
2931	6:23 a.m.	75_{24}	33 51.3	120 12.8	365	7.40	2746	2610	2673	34.17
2932	6:23 a.m.	75_{24}	33 51.3	120 12.8	185	8.80	.... ..	... ..	..... .	. ....
2933	6:25 a.m.	75_{24}	33 51.3	120 12.8	0	16.5	2715	2581	2472	33.79
2934	6:50 a.m.	75_{24}	33 51.3	120 12.8	137	9.20	2730	2595	2631	33.97
2935	6:50 a.m.	75_{24}	33 51.3	120 12.8	92	9.50	2716	2582	2613	33.80
2936	7:00 a.m.	75_{24}	33 51.3	120 12.8	64	10.10	2699	2566	2585	33.59
2937	7:00 a.m.	75_{24}	33 51.3	120 12.8	46	10.50	2718	2584	2596	33.83
2938	7:10 a.m.	75_{24}	33 51.3	120 12.8	37	10.90	2712	2578	2585	33.75
2939	7:10 a.m.	75_{24}	33 51.3	120 12.8	27	11.45	2710	2576	2573	33.73
2940	7:15 a.m.	75_{24}	33 51.3	120 12.8	23	11.90	2699	2566	2553	33.59
2941	7:15 a.m.	75_{24}	33 51.3	120 12.8	14	14.00	2703	2570	2516	33.64
2942	7:22 a.m.	75_{24}	33 51.3	120 12.8	18	12.30	2694	2561	2540	33.53
2943	7:22 a.m.	75_{24}	33 51.3	120 12.8	9	15.60	2693	2560	2472	33.52
2944	8:15 a.m.	75_{24}	33 49.6	120 16.2	735	5.15	.....	.... ..	.....	.... ..
2945	8:15 a.m.	75_{24}	33 49.6	120 16.2	550	6.40	2756	2620	2697	34.30
2946	8:50 a.m.	75_{24}	33 49.6	120 16.2	365	7.70	.....	.....	.... .	.....
2947	8:50 a.m.	75_{24}	33 49.6	120 16.2	185	9.10	2748	2612	2649	34.20
2948	9:00 a.m.	75_{24}	33 49.6	120 16.2	0	16.0	2698	2565	2467	33.58
2949	9:00 a.m.	75_{24}	33 49.6	120 16.2	137	9.20	2739	2604	2640	34.09
2950	9:09 a.m.	75_{24}	33 49.6	120 16.2	92	9.30	2734	2599	2633	34.02
2951	9:20 a.m.	75_{24}	33 49.6	120 16.2	73	9.40	2727	2592	2624	33.94
2952	9:20 a.m.	75_{24}	33 49.6	120 16.2	55	10.45	2713	2579	2593	33.76
2953	9:25 a.m.	75_{24}	33 49.6	120 16.2	46	10.60	2701	2568	2579	33.61
2954	9:25 a.m.	75_{24}	33 49.6	120 16.2	37	10.75	2699	2566	2574	33.59
2955	9:30 a.m.	75_{24}	33 49.6	120 16.2	27	10.90	2705	2572	2578	33.66
2956	9:30 a.m.	75_{24}	33 49.6	120 16.2	18	14.70	2694	2561	2492	33.53
2957	9:36 a.m.	75_{24}	33 49.6	120 16.2	23	11.25	2703	2570	2569	33.64
2958	9:36 a.m.	75_{24}	33 49.6	120 16.2	14	15.80	2697	2564	2471	33.57
2959	9:41 a.m.	75_{24}	33 49.6	120 16.2	9	15.90	2693	2560	2465	33.52
2960	11:40 a.m.	75_{24}	33 49.6	120 16.2	0	16.0	....	. ..	.. ....	.....
2961*	3:10 p.m.	79_{00}	33 39.3	120 33.0	1280	3.70	....	.... ..	..... .	.....
2962*	3:10 p.m.	79_{20}	33 39.3	120 33.0	1100	4.30	.... .	..... .	.....	.....

* Owing to an unusual drift, the recorded depths relative to water samples 2961–2965 are too great. Judging from the inclination of the cable, tney should be multiplied by about 0.8.

TABLE 1.—OCEAN DATA

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: $S\frac{0°}{4°0}$	Specific gravity: $S\frac{17°5}{17°5}$	Specific gravity: $S\frac{t°}{4°0}$	Salinity S ‰
				Aug. 21, 1911						
2963	3:10 p.m.	79_{20}	33° 39.3	120° 33.0	0	15°1	2702	2569	2492	33.63
2964	4:24 p.m.	79_{30}	33 39.3	120 33.0	915	4.80	.....	.....	.....	.....
2965	4:24 p.m.	79_{20}	33 39.3	120 33.0	730	5.40	.....	.....	.....	.....
				Aug. 22, 1911						
2966	6:10 a.m.	67_{17}	33 23.0	119 37.0	0	15.2	.....	.....	.....	.....
2967	10:40 a.m.	65_{15}	33 16.0	119 27.0	0	17.4	.....	.....	.....	.....
				Aug. 23, 1911						
2968	4:00 p.m.	51_{10}	33 22.0	118 16.0	0	20.7	2719	2585	2371	33.84
2969	4:26 p.m.	51_{10}	33 22.0	118 16.0	0	21.2	2720	2586	2358	33.85
				Aug. 24, 1911						
2970	7:45 a.m.	40_4	32 22.4	117 21.2	92	12.80	2695	2562	2531	33.54
2971	7:45 a.m.	40_4	32 22.4	117 21.2	137	.....	2720	2586	.....	33.85
2972	8:10 a.m.	40_4	32 22.4	117 21.2	110	11.90	.....	.....	.....	.....
2973	8:10 a.m.	40_4	32 22.4	117 21.2	137	11.25	2746	2610	2611	34.17
2974	8:20 a.m.	40_4	32 22.4	117 21.2	55	15.05	2704	2571	2495	33.65
2975	8:20 a.m.	40_4	32 22.4	117 21.2	73	.....	2706	2573	.....	33.68
2976	8:30 a.m.	40_4	32 22.4	117 21.2	46	16.50	2689	2556	2446	33.47
2977	8:30 a.m.	40_4	32 22.4	117 21.2	73	13.40	2694	2561	2519	33.53
2978	8:45 a.m.	40_4	32 22.4	117 21.2	0	19.15	.....	.....	.....	.....
2979	9:00 a.m.	40_4	32 22.4	117 21.2	0	19.15	.....	.....	.....	.....
2980	9:25 a.m.	40_4	32 22.4	117 21.2	27	19.1	.....	.....	.....	.....
2981	9:25 a.m.	40_4	32 22.4	117 21.2	37	18.45	2701	2568	2412	33.61
2982	9:35 a.m.	40_4	32 22.4	117 21.2	9	19.15	.....	.....	.....	.....
2983	9:35 a.m.	40_4	32 22.4	117 21.2	18	19.15	.....	.....	.....	.....
2984	10:55 a.m.	40_4	32 22.4	117 21.2	0	19.3	2696	2563	2385	33.55
2985	11:15 a.m.	40_4	32 22.4	117 21.2	0	19.3	2705	2572	2394	33.66
2986	1:55 p.m.	40_4	32 22.4	117 21.2	0	19.3	2707	2574	2396	33.69
2987	3:07 p.m.	40_4	32 22.4	117 21.2	0	19.4	2712	2578	2399	33.75
				Oct. 25, 1911						
2988	7:15 a.m.	40_5	32 22.7	117 19.2	0	19.2	2712	2578	2404	33.75
2989	7:20 a.m.	40_5	32 22.7	117 19.2	92	13.15	2715	2581	2545	33.79
2990	7:20 a.m.	40_5	32 22.7	117 19.2	137	10.95	2719	2584	2590	33.84
2991	7:29 a.m.	40_5	32 22.7	117 19.2	55	14.70	2683	2551	2482	33.39
2992	7:38 a.m.	40_5	32 22.7	117 19.2	73	13.80	.....	.....	.....	.....
2993	7:38 a.m.	40_5	32 22.7	117 19.2	110	12.10	2698	2565	2548	33.58
2994	8:00 a.m.	40_5	32 22.7	117 19.2	27	18.10	2708	2574	2428	33.70
2995	8:00 a.m.	40_5	32 22.7	117 19.2	46	14.85	2705	2572	2500	33.66
2996	8:03 a.m.	40_5	32 22.7	117 19.2	9	19.25	.....	.....	.....	.....
2997	8:08 a.m.	40_5	32 22.7	117 19.2	185	10.75	2729	2594	2603	33.96
2998	8:08 a.m.	40_5	32 22.7	117 19.2	275	9.65	.....	.....	.....	.....
2999	8:35 a.m.	40_5	32 22.7	117 19.2	0	19.5	.....	.....	.....	.....
3000	9:55 a.m.	40_5	32 22.7	117 19.2	0	20.1	.....	.....	.....	.....
3001	11:00 a.m.	40_5	32 22.7	117 19.2	0	20.2	2710	2576	2376	33.73
3002	1:00 p.m.	40_5	32 22.7	117 19.2	0	19.9	.....	.....	.....	.....
				Oct. 26, 1911						
3003	7:45 a.m.	40_5	32 22.7	117 19.2	550	.....	2763	2627	.....	34.39K
3004	7:50 a.m.	40_5	32 22.7	117 19.2	0	19.2	.....	.....	.....	.....
3005	8:15 a.m.	40_5	32 22.7	117 19.2	460	.....	2758	2622	.....	34.32K
3006	8:55 a.m.	40_5	32 22.7	117 19.2	365	.....	2764	2628	.....	34.40K
3007	9:05 a.m.	40_5	32 22.7	117 19.2	275	.....	2747	2611	.....	34.19K
3008	9:10 a.m.	40_5	32 22.7	117 19.2	0	19.1	2708	2574	2403	33.70
3009	9:20 a.m.	40_5	32 22.7	117 19.2	185	10.0	2722	2588	2609	33.88K
3010	12:30 p.m.	40_5	32 22.7	117 19.2	0	19.4	2711	2577	2398	33.74
				Oct. 27, 1911						
3011	7:00 a.m.	40_4	32 22.4	117 21.2	0	18.6	2704	2571	2411	33.65
3012	11:59 a.m.	40_4	32 22.4	117 21.2	0	19.2	2711	2577	2403	33.74
				Oct. 28, 1911						
3013	9:30 a.m.	40_5	32 22.7	117 19.2	0	18.8	2697	2564	2399	33.57
				Nov. 29, 1911						
3014	4:55 p.m.	39_6	32 29.5	117 13.5	0	16.0	.....	.....	.....	.....
				Nov. 30, 1911						
3015	4:20 a.m.	40_5	32 23.5	117 18.0	137	.....	2727	2592	.....	33.94
3016	4:40 a.m.	40_5	32 23.1	117 18.8	55	.....	2703	2570	.....	33.64
3017	4:45 a.m.	40_5	32 23.1	117 18.8	0	16.1	.....	.....	.....	.....
3018	5:30 a.m.	40_4	32 21.8	117 21.1	0	16.0	.....	.....	.....	.....

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: $S\frac{0°}{4°0}$	Specific gravity: $S\frac{17°5}{17°5}$	Specific gravity: $S\frac{t°}{4°0}$	Salinity S ‰
				Nov. 30, 1911						
3019	8:10 a.m.	40_5	32° 23.5	117° 18.0	0	16.1	.....	....	.....	.....
3020	9:30 a.m.	40_5	32 23.5	117 18.0	0	16.5	.....	.....	.....	.....
				Dec. 1, 1911						
3021	3:45 a.m.	40_5	32 22.7	117 19.2	92	.....	2715	2581	.....	33.79
3022	3:50 a.m.	40_5	32 22.7	117 19.2	0	16.5	.....	.....	.....	.....
3023	4:08 a.m.	$40_{4.5}$	32 22.5	117 19.5	37	....	2702	2569	.....	33.63
3024	4:25 a.m.	40_4	32 22.2	117 19.6	0	16.5	2701	2568	2458	33.61
3025	6:30 a.m.	40_5	32 22.6	117 19.2	0	16.1	.....	.....	.....	.....
3026	8:07 a.m.	40_4	32 22.0	117 19.3	0	16.0	.....	.....	.....	.....
3027	8:53 a.m.	40_4	32 22.4	117 21.2	0	16.4	.....	.....	.....	.....
				Dec. 2, 1911						
3028	4:45 a.m.	40_4	32 22.4	117 21.2	0	16.8	.....	.....	.....	.....
3029	5:30 a.m.	40_4	32 22.4	117 21.2	0	16.6	.....	.....	.....	.....
				Dec. 27, 1911						
3030	4:05 a.m.	40_5	32 23.5	117 18.0	137	....	2725	2590	.....	33.91
3031	5:00 a.m.	40_5	32 22.6	117 18.1	137	.....	2719	2585	.....	33.84
3032	5:12 a.m.	$40_{4.5}$	32 22.5	117 18.1	92	.....	2723	2588	.....	33.89
3033	6:10 a.m.	40_4	32 21.5	117 18.3	0	15.2	.....	.....	.....	.....
3034	7:15 a.m.	40_4	32 20.2	117 18.5	0	15.6	.....	.....	.....	.....
3035	9:00 a.m.	40_5	32 23.5	117 18.0	0	15.0	.....	.....	.....	.....
3036	9:38 a.m.	40_5	32 23.5	117 18.0	0	15.0	.....	.....	.....	.....
3037	10:48 a.m.	40_5	32 22.7	117 19.2	0	15.1	.....	.....	.....	.....
				Dec. 28, 1911						
3038	4:13 a.m.	40_5	32 22.7	117 19.2	137	.....	.....	.....	.....	.....
3039	4:13 a.m.	40_5	32 22.7	117 19.2	92	.....	2728	2593	.....	33.95
3040	4:20 a.m.	40_5	32 22.7	117 19.2	73	.....	2715	2581	.....	33.79
3041	4:32 a.m.	40_5	32 22.6	117 19.0	46	.....	2702	2569	.....	33.63
3042	4:48 a.m.	40_5	32 22.6	117 18.9	0	14.8	2705	2572	.....	33.66
3043	6:01 a.m.	40_4	32 22.3	117 18.4	110	.....	2723	2588	.....	33.89
3044	6:22 a.m.	40_4	32 22.25	117 18.3	0	14.8	.....	.....	.....	.....
3045	7:41 a.m.	40_4	32 22.4	117 21.2	92		2701	2568	.....	33.61
3046	8:05 a.m.	40_4	32 21.9	117 21.4	0	14.8	.....	.....	.....	.....
3047	8:55 a.m.	40_4	32 20.8	117 21.8	110	.....	2706	2573	.....	33.68
3048	8:55 a.m.	40_4	32 20.8	117 21.8	82	.....	2717	2583	.....	33.81
				Feb. 9, 1912						
3049	3:27 a.m.	40_5	32 23.5	117 18.0	92	11.70	.....	.....	.....	.....
3050	3:27 a.m.	40_5	From 3:25 to 6:50		137	10.40	.....	.....	.....	.....
3051	5:26 a.m.	40_4	a.m. the boat		55	14.45	2704	2571	2507	33.65
3052	5:26 a.m.	40_4	drifted from the		73	12.30	2712	2578	2558	33.75
3053	5:35 a.m.	40_4	above position		27	15.05	.....	.....	.....	.....
3054	5:35 a.m.	40_4	to the following		46	14.85	.....	.....	.....	.....
3055	5:43 a.m.	40_4	position		9	15.05	.....	.....	.....	.....
3056	5:43 a.m.	40_4			37	15.05	.....	.....	.....	.....
3057	5:45 a.m.	40_4			0	15.0	.....	.....	.....	.....
3058	6:40 a.m.	40_4	32 21.7	117 18.0	0	15.0	.....	.....	.....	.....
3059	8:42 a.m.	40_5	32 23.5	117 18.0	83	11.85	2721	2587	2576	33.86?
3060	8:52 a.m.	40_5	32 23.1	117 17.8	0	14.9	.....	.....	.....	.....
3061	8:56 a.m.	40_5	32 23.1	117 17.8	27	14.90	.....	.....	.....	.....
3062	8:56 a.m.	40_5	32 23.1	117 17.8	64	12.60	.....	.....	.....	.....
3063	9:02 a.m.	40_5	32 23.0	117 17.7	18	15.05	.....	.....	.....	.....
3064	9:07 a.m.	40_5	32 23.0	117 17.7	37	14.90	.....	.....	.....	.....
3065	9:42 a.m.	40_5	32 22.7	117 19.2	92	13.30	2712	2578	2539	33.79
3066	9:42 a.m.	40_5	From 9:40 to 10:56		137	11.15	.....	.....	.....	.....
3067	9:48 a.m.	40_4	a.m. the boat		73	12.65	.....	.....	.....	.....
3068	9:52 a.m.	40_5	drifted from the		27	15.15	.....	.....	.....	.....
3069	9:52 a.m.	40_5	above position		46	14.00	.....	.....	.....	.....
3070	9:58 a.m.	40_5	to the following		9	15.05	.....	.....	.....	.....
3071	9:58 a.m.	40_5	position		37	15.05	.....	.....	.....	.....
3072	10:00 a.m.	40_4	32 22.6	117 19.0	0	15.1	.....	.....	.....	.....
3073	12:25 p.m.	40_4	32 22.4	117 21.2	92	12.45	.....	.....	.....	.....
3074	12:25 p.m.	40_4	From 11:20 a.m. to		137	10.85	2736	2601	2609	34.05
3075	12:35 p.m.	40_4	1:00 p.m. the boat		55	12.95	.....	.....	.....	.....
3076	12:35 p.m.	40_4	drifted from the		73	13.60	.....	.....	.....	.....
3077	12:45 p.m.	40_4	above position		27	15.20	.....	.....	.....	.....
3078	12:45 p.m.	40_5	to the following		46	14.30	.....	.....	.....	.....
3079	12:55 p.m.	40_4	position		9	15.10	.....	.....	.....	.....

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position		Depth in meters	Temperature in centigrade	Specific gravity			Salinity S ‰
			North latitude	West longitude			0° S —— 4°0	17°5 S —— 17°5	t° S —— 4°0	
				Feb. 9, 1912						
3080	12:55 p.m.	40_4			37	15°05	....	....	....	.....
3081	1:00 p.m.	40_4	32° 21'.75	117° 20'.4	0	15.2	.. ....	.. ....	... .	.....
				Feb. 10, 1912						
3082	3:48 a.m.	40_5	32 22.7	117 19.2	92	11.60	..... .	. .	. .	.. ....
3083	3:48 a.m.	40_5	32 22.7	117 19.2	137	10.10	2747	2611	2632	34.19?
3084	4:00 a.m.	40_5	32 22.7	117 19.2	55	12.90	.	.....	.....	.. .. .
3085	4:00 a.m.	40_5	32 22.7	117 19.2	73	12.00	. ....	. .....	.....	.. .. .
3086	4:10 a.m.	40_5	32 22.7	117 19.2	27	14.95	.. ....	.....	....	.. ....
3087	4:10 a.m.	40_5	32 22.7	117 19.2	46	13.45	....	.....	. ....	.....
3088	4:15 a.m.	40_5	32 22.7	117 19.2	9	15.05	. ....	. ....	....	.....
3089	4:15 a.m.	40_5	32 22.7	117 19.2	37	14.20	2703	2570	2512	33.64
3090	11:16 a.m.	(39_5)	32 39.8	117 14.1	0	14.5	2710	2576	2512	33.73?
				Mar. 23, 1912						
3091	3:12 a.m.	40_5	32 23.5	117 18.0	83	10.80	. .	...	. .....	....
3092	3:14 a.m.	40_5	From 3:00 to 6:00		0	14.4	...	....	. ....	....
3093	3:26 a.m.	40_5	a.m. the boat		64	11.50	.. ....	....	. ....	..... .
3094	3:36 a.m.	40_5	drifted from the		46	13.30	.....	.....	.. ....	..... .
3095	3:46 a.m.	40_5	above position		37	14.00	.. ....	. ....	.. ....	.....
3096	3:56 a.m.	40_5	to the following		27	14.35	.. ....	.....	.....	.....
3097	4:02 a.m.	40_5	position		18	14.10	... .	. ....	.....	..... .
3098	4:11 a.m.	40_5			9	14.40	. ....	.....	. ....	.....
3099	4:16 a.m.	40_5			5	14.40	.....	.....	.....	.....
3100	4:28 a.m.	40_5			137	9.55	2734	2599	2629	34.02
3101	4:52 a.m.	40_5			82	10.80	.. .	.. ....	... .	... .
3102	5:03 a.m.	40_5			64	11.20	. ..	.... .	.....	.....
3103	5:15 a.m.	40_5			46	13.40	.... ..	.... ..		.. ....
3104	5:21 a.m.	40_5			37	13.85	.....	.....		.....
3105	5:23 a.m.	40_5			0	14.4	.. ....	.....	. ....	.....
3106	5:27 a.m.	40_5			27	14.25	. .	..... .	....	.... .
3107	5:36 a.m.	40_5			18	14.35	... ..	.... ..	.....	.....
3108	5:41 a.m.	40_5			9	14.40	. .. .	. ..	. ....	.....
3109	5:46 a.m.	40_5			5	14.40	. ....	. . .	.	.....
3110	6:00 a.m.	40_5	32 22.7	117 18.5	137	9.65	.....	.....	. .	.....
3111	6:42 a.m.	40_5	32 23.5	117 18.0	82	10.15	. ....	.... ..	.....	. .. .
3112	6:57 a.m.	40_5	From 6:40 to 7:45		64	10.90	. ....	.....	.....	.....
3113	7:07 a.m.	40_5	a.m. the boat		27	14.05	.... ..	.... ..	. ....	.....
3114	7:12 a.m.	40_5	drifted from the		37	13.75	. ....	.. ..	. ..	..... .
3115	7:21 a.m.	40_5	above position		27	14.10	. ....	.....	. .	.....
3116	7:26 a.m.	40_5	to the following		18	14.35	.....	.....	.....	.....
3117	7:31 a.m.	40_5	position		9	14.45	. ....	.....	.. ....	..... .
3118	7:35 a.m.	40_5			5	14.45	.. .	.... ..	. ....	. .. .
3119	7:40 a.m.	40_5	32 24.0	117 18.0	0	14.4	2714	2580	2518	33.78
3120	8:20 a.m.	40_5	32 22.7	117 19.2	73	10.90	.....	....	.....	
3121	8:21 a.m.	40_5	From 8:12 to 9:20		0	14.4	2713	2579	2517	33.76?
3122	8:32 a.m.	40_5	a.m. the boat		82	10.45	2724	2589	2603	33.90?
3123	8:41 a.m.	40_5	drifted from the		64	11.50	..... .		.....	.... ..
3124	8:47 a.m.	40_5	above position		46	12.75	.....	.....	.... ..	.... .
3125	8:53 a.m.	40_5	to the following		37	13.75	.....	.....	..... .	.....
3126	9:01 a.m.	40_5	position		27	14.15	. ....	. ....	.....	....
3127	9:05 a.m.	40_5			18	14.45	.... .	.	.....	....
3128	9:11 a.m.	40_5			9	14.45	.... .	.... ..	.....	..... .
3129	9:13 a.m.	40_5	32 23.2	117 18.5	5	14.45	. .		.....	..... .
3130	10:02 a.m.	40_4	32 22.4	117 21.2	82	10.45	..... .	.	.... .	.... .
3131	10:11 a.m.	$40_{4.5}$	From 9:52 to 10:55		64	11.70	.. ..	. ....	... .	.... .
3132	10:12 a.m.	40_5	a.m. the boat		0	14.8	.....	. ..	.....	....
3133	10:17 a.m.	40_5	drifted from the		46	12.90	.. ....	....	. .....	....
3134	10:25 a.m.	40_5	above position		37	13.65	....	...	.... ..	. ..
3135	10:31 a.m.	40_5	to the following		27	14.15	. .	.	. .	.... .
3136	10:37 a.m.	40_5	position		18	14.40	.... .	.. ....	. .	. .. .
3137	10:42 a.m.	40_5			9	14.50	....	.. ..	.... ..	. .
3138	10:48 a.m.	40_5			5	14.60	.... ..	... .	. ....	....
3139	10:52 a.m.	40_5	32 22.75	117 20.5	137	9.10	....	. .	.....	. . .
				Mar. 24, 1912						
3140	3:22 a.m.	40_5	32 22.7	117 19.2	82	10.50	2719	2585	2598	33.84?

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° S / 4°0	Specific gravity: 17°5 S / 17°5	Specific gravity: t° S / 4°0	Salinity S ‰
				Mar. 24, 1912						
3141	3:40 a.m.	40_5	From 3:15 to 6:30		46	12°95	.....	.....	.....	.....
3142	3:42 a.m.	40_5	a.m. the boat		0	14.8	.....	.....	.....	.....
3143	3:47 a.m.	$40_{4.5}$	drifted from the		37	14.15	.....	.....	.....	.....
3144	3:53 a.m.	40_4	above position		27	14.35	.....	.....	.....	.....
3145	4:06 a.m.	40_4	to the following		18	14.40	.....	.....	.....	.....
3146	4:16 a.m.	40_4	position		5	14.45	.....	.....	.....	.....
3147	4:22 a.m.	40_4			137	9.95	.....	.....	.....	.....
3148	4:30 a.m.	40_4			9	14.45	.....	.....	.....	.....
3149	4:47 a.m.	40_4			83	10.55	.....	.....	.....	.....
3150	5:02 a.m.	40_4			64	11.55	.....	.....	.....	.....
3151	5:42 a.m.	40_4			64	11.40	.....	.....	.....	.....
3152	5:49 a.m.	40_4			46	13.20	.....	.....	.....	.....
3153	5:55 a.m.	40_4			37	14.10	.....	.....	.....	.....
3154	6:00 a.m.	40_4			27	14.25	.....	.....	.....	.....
3155	6:06 a.m.	40_4			18	14.35	.....	.....	.....	.....
3156	6:09 a.m.	40_4			9	14.55	.....	.....	.....	.....
3157	6:14 a.m.	40_4			5	14.85	.....	.....	.....	.....
3158	6:18 a.m.	40_4			137	9.50	.....	.....	.....	.....
3159	6:21 a.m.	40_4			0	14.6	2707	2574	2507	33.69?
3160	6:30 a.m.	40_4	32° 21?2	117° 19?5	5	14.50	.....	.....	.....	.....
3161	8:07 a.m.	40_4	32 21.3	117 19.0	0	14.8	2707	2574	2503	33.69?
3162	8:30 a.m.	40_4	32 21.8	117 18.6	0	14.7	.....	.....	.....	.....
3163	8:58 a.m.	40_4	32 22.3	117 18.6	0	14.8	2699	2566	2495	33.59
3164	9:18 a.m.	40_4	32 22.4	117 18.6	0	14.95	2701	2568	2494	33.61
3165	9:40 a.m.	40_5	32 22.6	117 18.7	0	15.0	.....	.....	.....	.....
3166	10:05 a.m.	40_5	32 22.6	117 19.0	0	15.0	2699	2566	2491	33.59
3167	10:27 a.m.	40_5	32 22.6	117 19.3	0	15.0	2699	2566	2491	33.59
3168	10:56 a.m.	40_5	32 22.6	117 19.6	0	15.0	.....	.....	.....	.....
				Apr. 26, 1912						
3169	3:20 a.m.	40_5	32 23.5	117 18.0	83	9.90	.....	.....	.....	.....
3170	3:55 a.m.	40_5	From 3:00 to 5:10		64	11.10	2706	2573	2575	33.68
3171	4:05 a.m.	40_5	a.m. the boat		46	11.80	2699	2566	2555	33.59
3172	4:20 a.m.	$40_{4.5}$	drifted from the		37	12.20	.....	.....	.....	.....
3173	4:40 a.m.	40_4	above position		27	12.80	2696	2563	2532	33.55
3174	4:40 a.m.	40_4	to the following		0	15.0	2706	2573	2498	33.68
3175	4:48 a.m.	40_4	position		18	14.10	.....	.....	.....	.....
3176	4:57 a.m.	40_4			9	14.20	2704	2571	2513	33.65
3177	5:05 a.m.	40_4	32 21.9	117 18.2	5	14.55	2700	2567	2501	33.60
3178	6:00 a.m.	40_5	32 23.5	117 18.0	83	9.35	.....	.....	.....	.....
3179	6:15 a.m.	40_5	32 23.5	117 18.0	64	9.80	.....	.....	.....	.....
3180	6:30 a.m.	40_5	32 23.5	117 18.0	46	11.10	2703	2570	2572	33.63
3181	6:40 a.m.	40_5	32 23.5	117 18.0	37	11.75	2707	2574	2564	33.69
3182	6:45 a.m.	40_5	32 23.5	117 18.0	27	13.85	.....	.....	.....	.....
3183	6:55 a.m.	40_5	32 23.5	117 18.0	18	14.00	.....	.....	.....	.....
3184	7:05 a.m.	40_5	32 23.5	117 18.0	9	14.55	.....	.....	.....	.....
3185	7:10 a.m.	40_5	32 23.5	117 18.0	5	14.55	2701	2568	2502	33.61
3186	7:15 a.m.	40_5	32 23.5	117 18.0	0	14.9	.....	.....	.....	.....
3187	8:05 a.m.	40_5	32 23.5	117 18.0	110	9.15	.....	.....	.....	.....
3188	8:05 a.m.	40_5	32 23.5	117 18.0	137	9.05	2735	2600	2638	34.04
3189	8:45 a.m.	40_5	32 22.7	117 19.2	110	9.25	.....	.....	.....	.....
3190	8:45 a.m.	40_5	From 8:45 to 10:10		137	8.90	.....	.....	.....	.....
3191	9:00 a.m.	40_5	a.m. the boat		82	9.35	.....	.....	.....	.....
3192	9:10 a.m.	40_5	drifted from the		64	11.15	2701	2568	2569	33.61
3193	9:30 a.m.	40_5	above position		46	12.60	2698	2565	2538	33.58
3194	9:35 a.m.	40_5	to the following		37	13.05	2701	2568	2533	33.61
3195	9:45 a.m.	40_5	position		27	14.40	2704	2571	2508	33.65
3196	9:55 a.m.	40_5			18	14.60	2708	2574	2508	33.70
3197	10:00 a.m.	40_5			9	14.85	2704	2571	2499	33.65
3198	10:05 a.m.	40_5			5	15.00	2701	2568	2493	33.61
3199	10:10 a.m.	40_5	32 23.4	117 19.0	0	15.1	.....	.....	.....	.....
				July 16, 1912						
3200	12:22 p.m.	43_3	32 47.4	117 34.7	0	21.9	.....	.....	.....	.....
3201	12:35 p.m.	43_3	32 47.2	117 33.2	0	21.7	.....	.....	.....	.....
3202	12:42 p.m.	42_3	32 46.8	117 32.1	0	21.5	.....	.....	.....	.....

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: S 0°/4°0	Specific gravity: S 17°5/17°5	Specific gravity: S t°/4°0	Salinity S ‰
				July 16, 1912						
3203	12:50 p.m.	42,	32° 46.5	117° 30.95	0	20.9	.....	.....	.....	.....
3204	12:58 p.m.	42,	32 46.3	117 29.75	0	20.75	.....	.....	.....	.....
3205	1:05 p.m.	42,	32 46.05	117 28.7	0	21.0	.....	.....	.....	.....
3206	1:12 p.m.	41.5,	32 45.8	117 27.5	0	21.1	.....	.....	.....	.....
3207	1:20 p.m.	41,	32 45.5	117 26.45	0	21.05	.....	.....	.....	.....
3208	1:28 p.m.	41,	32 45.3	117 25.3	0	20.2	.....	.....	.....	.....
3209	1:35 p.m.	41,	32 44.95	117 24.25	0	20.2	.....	.....	.....	.....
3210	1:42 p.m.	41,	32 44.75	117 23.05	0	19.9	.....	.....	.....	.....
3211	1:50 p.m.	40,	32 44.5	117 21.9	0	19.8	.....	.....	.....	.....
3212	1:57 p.m.	40,	32 44.2	117 20.75	0	19.8	.....	.....	.....	.....
3213	2:04 p.m.	40,	32 44.0	117 19.6	0	19.3	.....	.....	.....	.....
3214	2:11 p.m.	40,	32 43.7	117 18.4	0	19.3	.....	.....	.....	.....
3215	2:15 p.m.	40,	32 43.55	117 17.8	0	19.5	.....	.....	.....	.....
3216	2:19 p.m.	(39,)	32 43.4	117 17.3	0	19.2	.....	.....	.....	.....
				July 17, 1912						
3217	6:37 a.m.	(39,)	32 43.0	117 16.8	0	18.6	2707	2574	2414	33.69
3218	6:45 a.m.	(39,)	From 6:30 to 7:45		23	11.90	2719	2585	2573	33.84
3219	6:50 a.m.	(39,)	a.m. the boat		18	12.14	2708	2574	2557	33.70
3220	6:55 a.m.	(39,)	drifted from the		14	12.97	2718	2584	2551	33.83
3221	6:55 a.m.	(39,)	above position		9	13.40	2710	2576	2535	33.73
3222	7:00 a.m.	(39,)	to the following		5	16.43	2714	2580	2473	33.78
3223	7:45 a.m.	(39,)	position		37	11.20	2718	2584	2584	33.83
3224	7:45 a.m.	(39,)	32 43.5	117 17.1	0	19.0	2705	2572	2402	33.66
3225	8:40 a.m.	40,	32 43.7	117 18.3	0	19.0	2707	2574	2404	33.69
3226	8:40 a.m.	40,	32 43.7	117 18.3	61	10.62?	2726	2591	2603	33.93
3227	9:14 a.m.	40,	32 44.1	117 20.0	0	19.4	2718	2584	2404	33.83?
3228	9:14 a.m.	40,	32 44.1	117 20.0	76	9.96	2714	2580	2603	33.78
3229	9:35 a.m.	40,	32 44.1	117 20.0	61	9.97	2707	2574	2596	33.69?
3230	9:35 a.m.	40,	32 44.1	117 20.0	46	10.52	2710	2576	2589	33.73
3231	9:45 a.m.	40,	32 44.1	117 20.0	30	11.35	2699	2566	2564	33.59
3232	9:45 a.m.	40,	32 44.1	117 20.0	21	12.28	.....	.....	.....	.....
3233	9:50 a.m.	40,	32 44.1	117 20.0	12	14.38	2719	2585	2522	33.84
3234	9:50 a.m.	40,	32 44.1	117 20.0	6	18.04	2714	2580	2435	33.78
3235	10:10 a.m.	40,	32 44.5	117 21.6	0	20.4	2704	2571	2364	33.65
3236	10:10 a.m.	40,	32 44.5	117 21.6	92	9.77	2719	2585	2609	33.84
3237	10:40 a.m.	41,	32 45.0	117 24.0	0	19.8	2712	2578	2388	33.75
3238	11:15 a.m.	41,	From 10:40 to 11:59		240	8.87	.....	.....	.....	.....
3239	11:15 a.m.	41,	a.m. the boat		330	8.48	.....	.....	.....	.....
3240	11:30 a.m.	41,	drifted from the		137	9.64	.....	.....	.....	.....
3241	11:30 a.m.	41,	above position		185	9.44	.....	.....	.....	.....
3242	11:40 a.m.	41,	to the following		64	10.06	.....	.....	.....	.....
3243	11:45 a.m.	41,	position		27	11.60	.....	.....	.....	.....
3244	11:45 a.m.	41,			37	11.10	.....	.....	.....	.....
3245	11:50 a.m.	41,			9	18.24	.....	.....	.....	.....
3246	11:50 a.m.	41,	32 46.25	117 22.4	18	13.00	.....	.....	.....	.....
				July 22, 1912						
3247*	6:10 a.m.	(39,)	32 43.2	117 16.7	0	20.2	2718	2584	2383	33.83
3248*	6:30 a.m.	(39,)	32 43.0	117 16.0	0	20.3	2730	2595	2392	33.97
3249	6:30 a.m.	(39,)	32 43.4	117 16.8	6	17.32	2703	2570	2441	33.64
3250	6:39 a.m.	(39,)	32 44.4	117 17.0	6	17.32	2721	2587	2458	33.86
3251	6:55 a.m.	(39,)	32 44.4	117 16.7	6	17.05	.....	.....	.....	.....
3252	7:30 a.m.	(39,)	32 43.5	117 17.1	0	20.0	2720	2586	2390	33.85
3253	8:30 a.m.	40,	32 43.7	117 18.3	0	20.0	2724	2589	2394	33.90
3254	8:30 a.m.	40,	32 43.7	117 18.3	61	10.60	2720	2586	2597	33.85
3255	9:00 a.m.	40,	32 44.1	117 20.0	0	19.9	2713	2579	2387	33.76
3256	9:00 a.m.	40,	32 44.1	117 20.0	70	10.50	2726	2591	2605	33.93
3257	9:30 a.m.	40,	32 44.5	117 21.6	0	20.3	2712	2578	2375	33.75
3258	9:30 a.m.	40,	32 44.5	117 21.6	92	10.30	2722	2588	2604	33.88
3259	10:20 a.m.	41,	32 45.0	117 24.1	0	20.5	2716	2582	2373	33.80
3260	10:20 a.m.	41,	32 45.0	117 24.1	355	8.40	2752	2616	2664	34.25
3261	11:20 a.m.	41,	32 45.5	117 26.4	0	20.5	2711	2577	2368	33.74
3262	12:10 p.m.	41,	32 45.5	117 26.4	0	20.5	2712	2578	2369	33.75
3263	5:56 p.m.	B	32 42.6	117 13.55	0	19.9	2720	2586	2393	33.85

* Collections made from a rowboat inside the kelp off Point Loma.

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: $S\frac{0°}{4°0}$	Specific gravity: $S\frac{17°5}{17°5}$	Specific gravity: $S\frac{t°}{4°0}$	Salinity S ‰
			July 22, 1912							
3264	5:56 p.m.	B	32° 42.6	117° 13.55	7	19°.30	.....	.....	.....	.....
3265	6:06 p.m.	B	32 43.0	117 13.6	7	19.00	2707	2574	2385	33.69
3266	8:15 p.m.	B	32 42.4	117 10.6	0	20.7	.....	.....	.....	.....
			July 24, 1912							
3267	3:40 a.m.	39_5	32 24.4	117 14.3	0	19.8	.....	.....	.....	.....
3268	3:47 a.m.	39_5	32 23.6	117 14.0	0	20.0	.....	.....	.....	.....
3269	3:55 a.m.	39_5	32 23.0	117 14.5	0	20.2	.....	.....	.....	.....
3270	4:00 a.m.	39_5	32 22.8	117 15.1	0	19.6	.....	.....	.....	.....
3271	4:05 a.m.	39_6	32 22.8	117 15.9	0	19.4	.....	.....	.....	.....
3272	4:10 a.m.	39_5	32 22.75	117 16.7	0	19.5	.....	.....	.....	.....
3273	4:15 a.m.	39_5	32 22.7	117 17.3	0	19.7	.....	.....	.....	.....
3274	4:35 a.m.	40_4	32 22.45	117 20.45	0	20.0	.....	.....	.....	.....
3275	4:40 a.m.	40_4	32 22.4	117 21.2	0	19.6	.....	.....	.....	.....
3276	4:52 a.m.	40_4	From 4:40 to 6:50		0	19.9	2724	2589	2397	33.90?
3277	5:20 a.m.	40_5	a.m. the boat		5	19.35	2715	2581	2403	33.79
3278	5:25 a.m.	40_5	drifted from the		5	19.35	2717	2583	2405	33.81
3279	5:45 a.m.	40_5	above position		9	19.2	.....	.....	.....	.....
3280	5:50 a.m.	40_5	to the following		9	19.2	2715	2581	2407	33.79
3281	5:52 a.m.	40_5	position		0	19.8	2711	2577	2387	33.74
3282	6:05 a.m.	40_5			18	16.00	2711	2577	2480	33.74
3283	6:10 a.m.	40_5			18	15.80	2713	2579	2487	33.76
3284	6:21 a.m.	40_5			27	13.20	.....	.....	.....	.....
3285	6:26 a.m.	40_5			27	13.60	2709	2575	2530	33.71
3286	7:00 a.m.	40_5	32 22.8	117 19.7	0	19.95	2712	2578	2384	33.75
3287	7:37 a.m.	40_4	32 22.4	117 21.2	46	11.65	2703	2570	2562	33.64
3288	7:42 a.m.	40_4	From 7:35 to 9:50		46	.....	2707	2574	.....	33.69
3289	7:55 a.m.	40_4	a.m. the boat		55	10.10	2724	2589	2609	33.90
3290	8:00 a.m.	40_4	drifted from the		55	.....	2728	2593	.....	33.95
3291	8:00 a.m.	40_4	above position		0	19.8	2716	2582	2392	33.80
3292	8:20 a.m.	40_4	to the following		92	9.90	2721	2587	2610	33.86
3293	8:25 a.m.	40_4	position		92	10.05	2726	2591	2612	33.93
3294	8:45 a.m.	40_4			46	12.00	2701	2568	2553	33.61
3295	8:50 a.m.	40_4			46	11.90	2701	2568	2555	33.61
3296	9:00 a.m.	40_4			0	20.0	2707	2574	2378	33.69
3297	9:05 a.m.	40_4			137	9.65	2726	2591	2619	33.93
3298	9:10 a.m.	40_4	32 22.2	117 19.3	137	9.70	2729	2594	2621	33.96
3299	10:05 a.m.	40_4	32 22.4	117 21.2	0	20.15	2720	2586	2386	33.85
3300	10:10 a.m.	40_4	From 10:05 to 11:43		137	9.60	2730	2595	2624	33.97
3301	10:15 a.m.	40_4	a.m. the boat		137	9.65	2729	2594	2622	33.96
3302	10:35 a.m.	40_4	drifted from the		185	9.40	2737	2602	2634	34.06
3303	10:40 a.m.	40_4	above position		185	9.40	.....	.....	.....	.....
3304	11:00 a.m.	40_4	to the following		0	20.2	2720	2586	2385	33.85
3305	11:10 a.m.	40_4	position		275	8.70	2769	2632	2676	34.46
3306	11:15 a.m.	$40_{4.5}$	32 22.5	117 19.15	275	8.70	2762	2626	2669	34.37
3307	12:01 p.m.	40_4	32 22.4	117 21.2	0	20.4	2720	2586	2379	33.85
3308	12:10 p.m.	40_4	From 12:01 to 2:48		365	8.25	2771	2634	2685	34.48
3309	12:15 p.m.	40_4	p.m. the boat		365	8.25	2764	2628	2678	34.40
3310	1:05 p.m.	40_4	drifted from the		0	20.4	2712	2578	2372	33.75
3311	1:30 p.m.	40_4	above position		365	8.20	2766	2630	2681	34.42
3312	1:35 p.m.	40_4	to the following		365	8.40	2775	2638	2686	34.53
3313	1:55 p.m.	40_4	position		27	13.70	2705	2572	2524	33.66
3314	2:00 p.m.	40_4			27	13.50	2710	2576	2533	33.73
3315	2:05 p.m.	40_4			0	20.4	2721	2587	2380	33.86
3316	2:41 p.m.	40_4	32 21.4	117 19.0	0	20.4	2712	2578	2372	33.75
3317	3:05 p.m.	39_5	32 22.75	117 16.8	0	20.4	.....	.....	.....	.....
3318	3:10 p.m.	39_5	32 23.2	117 16.25	0	20.7	.....	.....	.....	.....
3319	3:15 p.m.	39_5	32 23.5	117 15.8	0	20.7	.....	.....	.....	.....
3320	3:20 p.m.	39_5	32 23.8	117 15.25	0	20.6	.....	.....	.....	.....
3321	3:25 p.m.	39_5	32 23.4	117 14.8	0	20.8	.....	.....	.....	.....
3322*	3:33 p.m.	39_5	32 23.4	117 14.0	0	20.0	.....	.....	.....	.....
3323*	3:35 p.m.	39_5	32 23.4	117 14.0	0	20.6	.....	.....	.....	.....
3324	3:36 p.m.	39_5	32 23.4	117 14.0	0	20.6	.....	.....	.....	.....
3325	3:47 p.m.	39_5	32 24.4	117 14.3	0	20.5	.....	.....	.....	.....

* Observations taken about 60 feet apart on either side of a current streak extending to the southeast from the south end of South Coronado Island.

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0°/4°C	Specific gravity: 17°.5/17°.5	Specific gravity: 4°/4°C	Salinity S ‰
				July 25, 1912						
3326	3:09 a.m.	39.5	32° 24.4	117° 14.3	0	20.0				
3327	3:15 a.m.	39.5	32 23.6	117 14.0	0	20.35				
3328	3:21 a.m.	39.5	32 23.0	117 14.35	0	20.4				
3329	3:28 a.m.	39.5	32 22.8	117 15.2	0	19.6				
3330	3:35 a.m.	39.5	32 22.75	117 16.25	0	19.5				
3331	3:40 a.m.	39.5	32 22.75	117 17.0	0	19.8				
3332	3:50 a.m.	40.0	32 22.6	117 18.6	0	19.6				
3333	4:00 a.m.	40.5	32 22.5	117 20.0	0	19.9				
3334	4:07 a.m.	40.4	32 22.4	117 21.2	0	19.9				
3335	4:40 a.m.	40.4	32 22.4	117 21.2	55	10.85?	2713	2579	2586	33.76
3336	4:40 a.m.	40.4	From 4:07 to 5:45 a.m.		55		2717	2583		33.81
3337	4:55 a.m.	40.4	the boat drifted		73	10.00	2720	2586	2607	33.85
3338	4:55 a.m.	40.4	from the above		73	10.00	2721	2587	2608	33.86
3339	5:20 a.m.	40.4	position to the		0	19.7	2721	2587	2399	33.86
3340	5:20 a.m.	40.4	following position		73	10.00	2722	2588	2609	33.88
3341	5:25 a.m.	40.4	32 21.3	117 19.4	73	10.10	2729	2594	2614	33.96
3342	6:00 a.m.	40.4	32 22.4	117 21.2	0	20.0	2725	2589	2395	33.91
3343	6:35 a.m.	40.4	From 6:00 to 9:50		55		2707	2574		33.69
3344	6:40 a.m.	40.4	a.m. the boat		55		2711	2577		33.74
3345	6:55 a.m.	40.4	drifted from the		0	20.0	2709	2575	2380	33.71
3346	7:55 a.m.	40.4	above position		0	19.7	2710	2576	2389	33.73
3347	8:35 a.m.	40.4	to the following		275	8.80	2751	2615	2657	34.23
3348	8:40 a.m.	40.4	position		275	8.90	2746	2610	2652	34.17
3349	9:10 a.m.	40.4			0	20.05	2712	2578	2380	33.75
3350	9:20 a.m.	40.4			365	8.15	2752	2616	2668	34.25
3351	9:25 a.m.	40.4	32 21.45	117 19.4	365	8.5?	2757	2621	2667	34.31
3352	10:30 a.m.	40.4	32 22.4	117 21.2	0	20.25	2716	2582	2381	33.80
3353	10:35 a.m.	40.4	From 10:30 a.m. to		5	19.80	2710	2576	2386	33.73
3354	10:35 a.m.	40.4	12:26 p.m. the boat		5	19.90	2717	2583	2391	33.81
3355	11:15 a.m.	40.4	drifted from the		5	19.95	2708	2574	2380	33.70
3356	11:20 a.m.	40.4	above position		5	19.95	2714	2580	2386	33.78
3357	11:30 a.m.	40.4	to the following		9	19.50	2708	2574	2392	33.70
3358	11:35 a.m.	40.4	position		9	19.55	2712	2578	2394	33.75
3359	11:45 a.m.	40.4			18	15.95	2699	2566	2469	33.59
3360	11:50 a.m.	40.4			18	15.6?	2708	2574	2487	33.70
3361	12:01 p.m.	40.4			27	13.75	2699	2566	2517	33.59
3362	12:06 p.m.	40.4			27	13.50	2693	2560	2516	33.52
3363	12:12 p.m.	40.4			0	20.8	2716	2582	2365	33.80
3364	12:12 p.m.	40.4			37	12.10	2705	2572	2555	33.66
3365	12:17 p.m.	40.4	32 22.3	117 18.4	37	12.10	2697	2564	2547	33.57
3366	1:00 p.m.	40.4	32 22.4	117 21.2	5	19.65				
3367	1:00 p.m.	40.4	From 12:55 p.m. to		5	19.65	2713	2579	2394	33.76
3368	1:15 p.m.	40.4	1:50 p.m. the boat		55	10.55	2716	2582	2594	33.80
3369	1:20 p.m.	40.4	drifted from the		55	10.55				
3370	1:30 p.m.	40.4	above position to		73	10.20				
3371	1:35 p.m.	40.4	following position		73	10.20	2712	2578	2597	33.75
3372	1:44 p.m.	40.4	32 22.4	117 19.8	0	20.3	2708	2574	2371	33.70
3373	2:20 p.m.	39.5	32 24.1	117 16.0	0	20.5				
3374	2:25 p.m.	39.5	32 24.3	117 15.4	0	20.3				
3375	2:26 p.m.	39.5	32 24.4	117 15.25	0	19.95				
3376	2:29 p.m.	39.5	32 24.0	117 15.2	0	19.9				
3377*	2:40 p.m.	39.5	32 23.4	117 14.0	0	19.7				
3378*	2:40 p.m.	39.5	32 23.4	117 14.0	0	21.2				
3379	3:00 p.m.	39.5	32 24.0	117 14.2	0	21.2				
3380	3:07 p.m.	39.5	32 24.4	117 14.3	0	20.9				
				July 26, 1912						
3381	3:07 a.m.	39.5	32 24.4	117 14.3	0	20.4				
3382	3:12 a.m.	39.5	32 24.0	117 14.2	0	20.5				
3383	3:25 a.m.	39.5	32 23.0	117 14.35	0	19.8				
3384	3:30 a.m.	39.5	32 22.9	117 15.0	0	19.3				
3385	3:35 a.m.	39.5	32 22.8	117 16.0	0	19.4				
3386	3:40 a.m.	39.5	32 22.75	117 16.8	0	19.6				
3387	3:50 a.m.	40.0	32 22.6	117 18.5	0	19.6				

* Current streak observations. See water samples 3322 and 3323.

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° S / 4°0	Specific gravity: 17°5 S / 17°5	Specific gravity: t° S / 4°0	Salinity S ‰
				July 26, 1912						
3388	4:05 a.m.	40_4	32° 22'4	117° 21'2	0	19°8	2712	2578	2388	33.75
3389	4:27 a.m.	40_4	From 4:05 to 6:37		185	9.40	2751	2615	2649	34.23
3390	4:32 a.m.	40_4	a.m. the boat		185	9.60	2744	2609	2638	34.15
3391	5:00 a.m.	40_4	drifted from the		0	19.4	2712	2578	2399	33.75
3392	5:40 a.m.	40_4	above position		275	8.75	2750	2614	2657	34.22
3393	6:00 a.m.	40_4	to the following		0	19.65	.....	.....	...	.....
3394	6:20 a.m.	40_4	position		137	9.40	2739	2604	2636	34.09?
3395	6:25 a.m.	40_4	32 22.05	117 20.9	137	. ....	2714	2580	. .	33.78?
3396	7:05 a.m.	40_4	32 22.4	117 21.2	365	8.10	2749	2613	2665	34.21
3397	7:05 a.m.	40_4	From 6:50 to 9:47		0	19.9	.....	.....	... .	.....
3398	7:45 a.m.	40_4	a.m. the boat		5	19.75	2712	2578	2389	33.75
3399	7:50 a.m.	40_4	drifted from the		5	.....	2709	2575	... .	33.71
3400	8:00 a.m.	40_4	above position		0	19.7	2710	2576	2389	33.73
3401	8:45 a.m.	40_4	to the following		9	19.35	2711	2577	2399	33.74
3402	8:50 a.m.	40_4	position		9	....	2712	2578	... ...	33.75
3403	9:00 a.m.	40_4			0	20.0	2716	2582	2386	33.80
3404	9:00 a.m.	40_4			18	16.00	2686	2553	2455	33.43?
3405	9:05 a.m.	40_4			18	16.00	2700	2567	2469	33.60?
3406	9:15 a.m.	40_4			27	14.15	2720	2586	2507	33.85
3407	9:20 a.m.	40_4			27	14.10	2725	2590	2534	33.91
3408	9:30 a.m.	40_4			37	12.50	.....	... .	.....	.....
3409	9:35 a.m.	40_4	32 21.95	117 19.5	37	12.50	2723	2588	2564	33.89
3410	10:07 a.m.	40_4	32 22.4	117 21.2	46	11.15	2717	2583	2584	33.81
3411	10:12 a.m.	40_4	From 10:05 a.m. to		46	11.15	2720	2586	2587	33.85
3412	10:12 a.m.	40_4	12:14 p.m. the boat		0	20.3	2715	2581	2378	33.79
3413	10:27 a.m.	40_4	drifted from the		55	10.30	2725	2588	2605	33.89
3414	10:32 a.m.	40_5	above position		55	10.35	2728	2593	2609	33.95
3415	11:00 a.m.	40_5	to the following		0	20.3	2717	2583	2379	33.81
3416	11:30 a.m.	40_5	position		73	10.15	2723	2588	2608	33.89
3417	11:35 a.m.	40_5			73	10.15	2727	2592	2612	33.94
3418	11:54 a.m.	40_5			92	10.00	2714	2580	2602	33.78
3419	11:59 a.m.	40_5			92	10.00	2713	2579	2601	33.76
3420	11:59 a.m.	40_5			0	20.6	2710	2576	2365	33.73
3421	12:15 p.m.	40_5	32 23.3	117 19.0	0	20.6	.. ....	.....	.....	.....
3422	12:20 p.m.	40_5	32 23.5	117 18.25	0	20.7	.....	.....	.....	.....
3423	12:25 p.m.	39_5	32 23.7	117 17.4	0	20.4	.....	.....	.....	.....
3424	12:30 p.m.	39_5	32 23.8	117 16.5	0	20.6	.. ..	.. ..	.. ..	.. ....
3425	12:35 p.m.	39_5	32 24.1	117 15.7	0	20.4	.....	.....	.....	.....
3426	12:39 p.m.	39_5	32 24.2	117 15.05	0	20.4	.....	.....	... .	.....
3427	12:49 p.m.	39_5	32 23.4	117 14.75	0	20.0	.. ..	.. ..	.	.. ..
3428	12:55 p.m.	39_5	32 23.25	117 14.3	0	19.4	.....	.....	... ...	...
3429*	1:20 p.m.	39_5	32 23.4	117 14.0	0	18.8	2702	2569	2404	33.63
3430*	1:20 p.m.	39_5	32 23.4	117 14.0	0	20.6	2708	2574	2363	33.70
3431	1:31 p.m.	39_5	32 24.4	117 14.3	0	21.1	.....	.....	.....	.....
				July 27, 1912						
3432	4:15 a.m.	39_5	32 24.4	117 14.3	0	20.4	....	.....	.....	.....
3433	4:25 a.m.	39_5	32 23.4	117 14.0	0	20.3	.... .	.....	.....	.. ..
3434	4:28 a.m.	39_5	32 23.0	117 14.35	0	20.3	....	.....	.....	.....
3435	4:32 a.m.	39_5	32 22.9	117 14.8	0	19.6	....	.....	.....	.. ....
3436	4:40 a.m.	39_5	32 22.8	117 15.8	0	19.3	..... .	.....	.....	.....
3437	4:50 a.m.	39_5	32 22.75	117 17.15	0	19.5	.....	.....	. ..	. ..
3438	5:00 a.m.	40_5	32 22.65	117 18.4	0	19.2	....	.. ....	.. ..	.. ..
3439	5:10 a.m.	40_5	32 22.6	117 19.75	0	19.5	.....	.....	. ....	...
3440	5:20 a.m.	40_4	32 22.4	117 21.2	0	20.1	2710	2576	2378	33.73
3441	5:45 a.m.	40_4	From 5:20 to 7:33		92	9.80	.. ....	.....	...	.....
3442	6:05 a.m.	40_4	a.m. the boat		0	20.2	2707	2574	2373	33.69
3443	6:07 a.m.	40_4	drifted from the		46	10.45	.....	.....	.....	.....
3444	6:12 a.m.	40_4	above position		46	.. ....	2702	2569	. ....	33.63
3445	6:25 a.m.	40_4	to the following		37	11.05	... .	.....	.....	.. ....
3446	6:30 a.m.	40_4	position		37	11.05	2696	2563	2566	33.55
3447	6:45 a.m.	40_4			185	8.95	.....	.....	...	.....
3448	6:50 a.m.	40_4			185	9.15	2751	2615	2652	34.23

* Current streak observations. See water samples 3322 and 3323.

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: $S_{\frac{0°}{4°0}}$	Specific gravity: $S_{\frac{17°5}{17°5}}$	Specific gravity: $S_{\frac{t°}{4°0}}$	Salinity $S^{0}/_{00}$
				July 27, 1912						
3449	7:00 a.m.	40_4	32° 22.15	117° 19.55	0	19.0	2714	2580	2411	33.78
3450	8:05 a.m.	40_4	32 22.1	117 20.5	0	19.4	2716	2582	2403	33.80
3451	8:09 a.m.	40_4	32 22.1	117 20.5	137	9.50	2728	2593	2624	33.95
3452	8:14 a.m.	40_4	32 22.1	117 20.5	137	9.50	.....	.....	.....	.....
3453	9:00 a.m.	40_4	32 22.4	117 21.2	0	19.2	2711	2577	2403	33.74
3454	9:46 a.m.	40_4	From 9:22 a.m. to		550	6.30	2765	2629	2707	34.41
3455	9:55 a.m.	40_4	12:08 p.m. the boat		0	20.0	2721	2587	2391	33.86
3456	10:45 a.m.	40_4	drifted from the		18	15.5	2709	2575	2490	33.71
3457	11:20 a.m.	40_4	above position to		0	19.8	2722	2588	2397	33.88
3458	11:40 a.m.	40_4	following position		275	8.80	.....	.....	.....	.....
3459	11:45 a.m.	40_4	32 21.35	117 20.5	275	8.85	2761	2625	2666	34.36
3460	12:45 p.m.	40_4	32 22.3	117 20.4	0	20.0	2716	2582	2386	33.80
3461	12:50 p.m.	40_4	32 22.3	117 20.0	137	9.50	.....	.....	.....	.....
3462	1:34 p.m.	$40_{4.5}$	32 22.5	117 18.8	0	19.9	.....	.....	.....	.....
3463	1:42 p.m.	40_5	32 23.0	117 17.7	0	19.8	.....	.....	.....	.....
3464	1:52 p.m.	39_5	32 23.5	117 16.4	0	19.6	.....	.....	.....	.....
3465	1:57 p.m.	39_5	32 23.8	117 15.6	0	20.0	.....	.....	.....	.....
3466	2:02 p.m.	39_5	32 24.2	117 15.05	0	20.0	.....	.....	.....	.....
3467	2:11 p.m.	39_5	32 23.4	117 14.75	0	19.4	.....	.....	.....	.....
3468	2:14 p.m.	39_5	32 23.0	117 14.35	0	19.0	.....	.....	.....	.....
3469*	2:17 p.m.	39_5	32 23.4	117 14.0	0	19.2	.....	.....	.....	.....
3470*	2:17 p.m.	39_5	32 23.4	117 14.0	0	21.1	.....	.....	.....	.....
3471	2:19 p.m.	39_5	32 23.5	117 14.0	0	21.1	.....	.....	.....	.....
3472	2:27 p.m.	39_5	32 24.4	117 14.3	0	20.7	.....	.....	.....	.....
3473	7:00 p.m.	39_5	32 24.4	117 14.3	0	19.2	2708	2574	2400	33.70
3474	9:00 p.m.	39_5	32 24.4	117 14.3	0	19.9	2708	2574	2382	33.70
				July 28, 1912						
3475	1:00 a.m.	39_5	32 24.4	117 14.3	0	19.4	2707	2573	2394	33.69
3476	5:10 a.m.	39_5	32 24.4	117 14.3	0	19.1	2708	2574	2403	33.70
3477	7:55 a.m.	39_5	32 24.4	117 14.3	0	19.2	2715	2581	2407	33.79
3478	8:10 p.m.	40_4	32 22.4	117 21.2	5	20.45	2723	2588	2380	33.89
3479	8:15 p.m.	40_4	From 8:00 to 10:24		5	20.45	2721	2587	2379	33.86
3480	8:25 p.m.	40_4	p.m. the boat		0	20.4	2719	2585	2378	33.84
3481	8:26 p.m.	40_4	drifted from the		9	18.3	2724	2589	2438	33.90
3482	8:26 p.m.	40_4	above position		9	.....	2716	2582	.....	33.80
3483	8:40 p.m.	40_4	to the following		18	14.0	2707	2574	2520	33.69
3484	8:52 p.m.	40_4	position		27	11.75	2713	2579	2570	33.76
3485	8:58 p.m.	40_4			27	11.85	2715	2581	2570	33.79
3486	9:55 p.m.	40_4	32 20.75	117 19.2	0	20.1	2714	2580	2382	33.78
3487	10:45 p.m.	40_4	32 21.75	117 20.6	37	.....	2704	2571	.....	33.65
3488	10:50 p.m.	40_4	From 10:38 p.m. on		37	11.25	2704	2571	2570	33.65
3489	11:00 p.m.	40_4	the 28th to 1:45		0	20.1	2710	2576	2378	33.73
3490	11:15 p.m.	40_4	a.m. on the 29th		46	10.75	.....	.....	.....	.....
3491	11:35 p.m.	40_4	the boat drifted		55	10.6	.....	.....	.....	.....
				July 29, 1912						
3492	12:10 a.m.	40_4	from the above		73	10.1	2716	2582	2601	33.80
3493	12:15 a.m.	40_4	position to the		73	.....	2715	2581	.....	33.79
3494	12:25 a.m.	40_4	following position		92	9.75	2712	2578	2605	33.75
3495	12:45 a.m.	40_4			0	19.9	2715	2581	2389	33.79
3496	12:50 a.m.	40_4			137	9.45	2739	2604	2636	34.09
3497	12:50 a.m.	40_4			137	9.45	.....	.....	.....	.....
3498	1:15 a.m.	40_4			185	9.35	2746	2610	2644	34.18
3499	1:20 a.m.	40_4			185	9.35	2755	2619	2652	34.28
3500	1:40 a.m.	40_4	32 19.95	117 19.0	0	19.6	2716	2582	2397	33.80
3501	2:50 a.m.	40_4	32 21.65	117 21.0	0	19.85	2710	2576	2385	33.73
3502	2:55 a.m.	40_4	From 2:02 to 4:05		185	9.25	2749	2613	2649	34.21
3503	2:55 a.m.	40_4	a.m. boat drifted		185	9.25	2748	2612	2648	34.20
3504	3:30 a.m.	40_4	from above position		275	8.40	2751	2615	2663	34.23
3505	3:35 a.m.	40_4	to following position		275	8.50	2749	2613	2660	34.21
3506	3:40 a.m.	40_4	32 21.1	117 19.5	0	19.5	2705	2572	2389	33.66
3507	8:07 p.m.	40_4	32 22.4	117 21.2	46	10.45	2697	2564	2577	33.57

* Current streak observations. See water samples 3322 and 3323.

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° S / 4°0	Specific gravity: 17°5 S / 17°5	Specific gravity: t° S / 4°0	Salinity S ‰
				July 29, 1912						
3508	8:12 p.m.	40_4	From 7:58 to 10:30		46	10°45	2699	2566	2579	33.59
3509	8:12 p.m.	40_4	p.m. the boat		0	20.2	2708	2574	2374	33.70
3510	9:30 p.m.	40_4	drifted from the		5	19.8	2706	2573	2382	33.68K
3511	9:42 p.m.	40_4	above position		9	19.4	2706	2573	2393	33.68K
3512	9:55 p.m.	40_4	to the following		18	15.3	2710	2576	2495	33.73K
3513	10:07 p.m.	40_4	position		27	13.3	3703	3570	3530	33.64K
3514	10:25 p.m.	40_4	32° 21'8	117° 19'75	0	19.7	2709	2575	2388	33.71
3515	10:45 p.m.	40_5	32 23.0	117 20.8	37	11.7	2714	2580	2572	33.78K
3516	11:00 p.m.	40_5	32 23.0	117 20.7	46	11.0	2697	2564	2568	33.57K
3517	11:15 p.m.	40_5	32 22.55	117 20.5	55	10.5	2702	2569	2582	33.63K
3518	11:32 p.m.	40_5	32 22.55	117 20.25	73	10.15	2710	2576	2581	33.73K
				July 30, 1912						
3519	12:10 a.m.	40_5	32 23.75	117 20.7	92	9.85	2711	2577	2602	33.74K
3520	12:29 a.m.	40_5	32 23.7	117 20.6	137	9.5	2733	2598	2629	34.01K
3521	12:36 a.m.	40_5	32 23.6	117 20.5	0	19.4	2710	2576	2397	33.73
3522	1:00 a.m.	40_5	32 23.4	117 20.3	185	9.2	2750	2614	2650	34.22K
3523	1:45 a.m.	40_5	32 23.1	117 20.0	275	8.8	.....	.....	.....	.....K
3524	2:00 a.m.	40_5	32 23.0	117 19.9	0	19.0	2706	2573	2403	33.68
3525	2:50 a.m.	40_5	32 24.5	117 19.1	365	8.3	2752	2616	2665	34.25K
3526	3:50 a.m.	40_5	32 23.25	117 18.8	0	18.8	2705	2572	2410	33.66
3527	7:50 p.m.	40_4	32 22.4	117 21.2	0	19.6	2706	2573	2387	33.68
3528	8:00 p.m.	40_4	From 5:50 to 11:46		55	10.6	2704	2571	2582	33.65K
3529	8:07 p.m.	40_4	p.m. the boat		73	10.0	2707	2574	2595	33.69K
3530	8:25 p.m.	40_4	drifted from the		92	9.6	2712	2578	2607	33.75K
3531	8:42 p.m.	40_4	above position		137	9.4	2735	2600	2632	34.04K
3532	8:55 p.m.	40_4	to the following		0	19.4	2709	2575	2396	33.71
3533	9:05 p.m.	40_4	position		185	9.05	2746	2610	2649	34.17K
3534	9:32 p.m.	40_4			275	8.8	2755	2619	2661	34.29K
3535	9:55 p.m.	40_4			0	19.4	2710	2576	2397	33.73
3536	10:07 p.m.	40_4			365	8.0	2756	2620	2674	34.30K
3537	10:50 p.m.	40_4			550	.....	2757	2621	.....	34.31K
3538	10:55 p.m.	40_4	32 21.2	117 19.7	0	19.4	2706	2573	2393	33.68
				July 31, 1912						
3539	12:07 a.m.	40_4	32 22.4	117 20.0	0	19.5	2711	2577	2395	33.74
3540	12:10 a.m.	40_4	From 12:01 to 2:20		275	8.75	2744	2609	2650	34.15K?
3541	12:42 a.m.	40_4	a.m. the boat		185	9.1	2747	2611	2649	34.19K
3542	1:07 a.m.	40_4	drifted from the		5	19.55	.....	.....	.....	.....K
3543	1:10 a.m.	40_4	above position		0	19.6	2710	2576	2391	33.73
3544	1:17 a.m.	40_4	to the following		9	17.0	2705	2572	2451	33.66K
3545	1:31 a.m.	40_4	position		18	14.9	2696	2563	2490	33.55K
3546	1:37 a.m.	40_4			27	13.85	2693	2560	2509	33.52K
3547	1:50 a.m.	40_4			37	12.6	2690	2557	2530	33.48K
3548	2:02 a.m.	40_4			46	11.5	2694	2561	2556	33.53K
3549	2:12 a.m.	40_4			0	19.8	2710	2576	2386	33.73
3550	2:14 a.m.	40_4	32 21.75	117 19.0	55	10.65	2699	2566	2576	33.59K
3551	2:43 a.m.	40_5	32 22.9	117 19.3	73	10.15	2706	2573	2590	33.68K
3552	2:58 a.m.	40_5	32 22.8	117 19.2	92	9.55	2710	2576	2606	33.73K
3553	3:15 a.m.	40_4	32 22.65	117 19.05	137	9.45	2721	2587	2618	33.86K
3554	3:27 a.m.	40_4	32 22.4	117 18.9	0	19.3	2709	2575	2398	33.71
				Aug. 1, 1912						
3555	8:00 a.m.	40_4	32 22.4	117 21.2	550	.....	2753	2617	.....	34.26K
3556	8:05 a.m.	40_4	32 22.4	117 21.0	0	19.5	2708	2574	2392	33.70
3557	9:05 a.m.	$40_{4.5}$	32 22.5	117 20.6	0	19.7	2706	2573	2385	33.68
3558	10:00 a.m.	40_4	32 22.4	117 21.2	0	19.9	2711	2577	2385	33.74
3559	11:25 a.m.	40_4	32 22.4	117 21.2	0	20.2	2712	2578	2378	33.75
3560	12:40 p.m.	40_4	32 22.4	117 21.2	0	20.15	2713	2579	2380	33.76
3561	1:44 p.m.	40_4	32 22.4	117 21.2	275	9.35	2750	2614	2647	34.22K
3562	2:02 p.m.	40_4	32 22.3	117 20.9	0	20.5	2718	2584	2375	33.83
3563	2:13 p.m.	40_4	32 22.3	117 20.7	185	9.55	2743	2608	2638	34.14K
3564	2:38 p.m.	40_4	32 22.2	117 20.3	137	9.6	2726	2591	2620	33.93K
3565	2:55 p.m.	40_4	32 22.2	117 20.1	92	10.05	2705	2572	2592	33.66K
3566	3:07 pm..	40_4	32 22.1	117 19.9	0	20.3	2709	2575	2372	33.71
3567	3:45 p.m.	40_4	32 22.4	117 21.2	37	11.8	2689	2556	2545	33.47K
3568	3:57 p.m.	40_4	32 22.3	117 21.1	18	14.2	2700	2567	2509	33.60K
3569	4:05 p.m.	40_4	32 22.2	117 21.05	0	20.6	2712	2578	2367	33.75

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: $S\frac{0°}{4°0}$	Specific gravity: $S\frac{17°5}{17°5}$	Specific gravity: $S\frac{t°}{4°0}$	S °/₀₀ Salinity
			Aug. 1, 1912							
3570	4:07 p.m.	40_4	32° 22'2	117° 21.05	365	8°2	2755	2619	2670	34.29K
3571	4:45 p.m.	40_4	32 21.9	117 20.8	275	8.7	2756	2620	2663	34.30K
3572	5:03 p.m.	40_4	32 21.8	117 20.6	0	20.4	2711	2577	2371	33.74
3573	5:37 p.m.	40_4	32 22.4	117 21.2	185	9.45	2745	2610	2641	34.16K
3574	6:02 p.m.	40_4	From 5:35 to 7:49		137	9.55	2733	2598	2628	34.01K
3575	6:15 p.m.	40_4	p.m. the boat		0	20.2	2707	2574	2373	33.69
3576	6:20 p.m.	40_4	drifted from the		92	9.8	2704	2571	2596	33.65K
3577	6:35 p.m.	40_4	above position		73	10.15	2703	2570	2588	33.64K
3578	6:53 p.m.	40_4	to the following		55	10.8	2691	2558	2565	33.49K
3579	7:05 p.m.	40_4	position		0	20.2	2710	2576	2376	33.73
3580	7:10 p.m.	40_4	32 21.2	117 17.9	365	8.0	2754	2618	2672	34.27K
			Aug. 2, 1912							
3581	1:28 p.m.	40_4	32 22.4	117 21.2	5	20.35	2706	2573	2368	33.68K
3582	1:35 p.m.	40_4	32 22.4	117 21.1	0	20.5	2724	2589	2380	33.90
3583	1:40 p.m.	40_4	32 22.3	117 21.0	9	20.15	2720	2586	2386	33.85K
3584	1:50 p.m.	40_4	32 22.3	117 20.8	550	.....	2757	2621	.....	34.31K
3585	3:00 p.m.	40_4	32 22.4	117 21.2	735	.....	2763	2627	.....	34.39K
3586	3:15 p.m.	40_4	32 22.3	117 20.9	0	20.6	2714	2580	2369	33.78
3587	4:15 p.m.	40_4	32 21.8	117 19.9	0	20.4	2718	2584	2377	33.83
3588	4:45 p.m.	40_3	32 21.6	117 19.4	46	11.35	2698	2565	2563	33.58K
3589	5:20 p.m.	40_2	32 22.7	117 20.6	37	12.0	2704	2571	2556	33.65K
3590	5:32 p.m.	40_1	From 5:20 to 6:10		27	13.5	2699	2566	2522	33.59K
3591	5:40 p.m.	$40_{1.5}$	p.m. the boat		0	20.0	2712	2578	2383	33.75
3592	5:43 p.m.	40_1	drifted from the		18	15.2	2694	2561	2482	33.53K
3593	5:50 p.m.	40_1	above position to		9	19.95	2711	2577	2383	33.74K
3594	6:00 p.m.	40_4	following position		5	20.1	2714	2580	2382	33.78K
3595	6:05 p.m.	40_4	32 21.75	117 20.0	0	20.4	2711	2577	2371	33.74
			Aug. 3, 1912							
3596	6:15 a.m.	40_4	32 22.2	117 20.5	550	.....	2760	2624	.....	34.35K
3597	6:40 a.m.	40_4	From 6:07 to 8:21		0	20.0	2715	2581	2386	33.79
3598	7:02 a.m.	40_4	a.m. the boat		5	19.6	2707	2574	2388	33.69K
3599	7:35 a.m.	40_4	drifted from the		9	19.4	2711	2577	2398	33.74K
3600	7:45 a.m.	40_4	above position		18	15.75	2693	2560	2479	33.52K
3601	7:52 a.m.	40_4	to the following		0	19.7	2717	2583	2396	33.81
3602	7:55 a.m.	40_4	position		27	13.4	2690	2557	2515	33.48K
3603	8:06 a.m.	40_4	32 21.6	117 20.45	37	12.0	2691	2558	2543	33.49K
3604	8:40 a.m.	40_3	32 22.4	117 21.2	46	11.4	2694	2561	2558	33.53K
3605	8:52 a.m.	40_4	From 8:40 to 10:53		55	10.9	2699	2566	2572	33.59K
3606	9:05 a.m.	40_4	a.m. the boat		92	9.95	2722	2588	2610	33.88K
3607	9:17 a.m.	40_4	drifted from the		185	9.5	2742	2607	2638	34.12K
3608	9:45 a.m.	40_4	above position to		365	8.25	2754	2618	2668	34.27K
3609	10:20 a.m.	40_4	following position		550	.....	2754	2618	.....	34.27K
3610	10:22 a.m.	40_4	32 21.9	117 18.55	0	19.8	2710	2576	2383	33.73
			Aug. 18, 1912							
3611	5:00 a.m.	77_{120}	34 26.7	120 26.6	0	15.4	. . .	.....	... .	...
3612	6:00 a.m.	(78_0)	34 31.2	120 31.5	0	12.9	.....	... ..	.. .	....
3613	7:00 a.m.	(79_3)	34 36.0	120 34.3	0	11.9	....	.....	. .	....
3614	8:00 a.m.	(79_2)	34 40.8	120 37.1	0	12.2	. ....	... ...	. ..	. ..
3615	9:00 a.m.	$(80)_{37}$	34 45.5	120 39.0	0	12.6	.. ..	... .	...	....
3616	10:00 a.m.	$(80)_{34}$	34 52.0	120 40.0	0	11.8	...	.....	....	. .
3617	11:00 a.m.	$(80)_{28}$	35 1.0	120 40.0	0	12.3	.. ... .	.....	.. ...	. .
3618	11:55 a.m.	(80_{25})	35 8.2	120 38.7	0	13.6	.....	.....	. .	.. ....
3619	1:00 p.m.	$81_{[0]_{23}}$	35 9.0	120 44.0	0	14.4	.....	... ...	.	....
3620	2:00 p.m.	(82_{18})	35 10.5	120 48.7	0	12.7	.....	.	.. ... .	. ....
3621	3:00 p.m.	$(83)_{19}$	35 16.0	120 55.5	0	12.6	....	....	. .	....
3622	4:00 p.m.	83_{10}	35 22.2	120 55.0	0	13.4	..	... ...	... .	..
3623	4:55 p.m.	(83_{11})	35 26.2	120 55.0	0	12.2	..... .	... .	.	. ....
			Aug. 19, 1912							
3624	5:00 a.m.	$84_{(11)}$	35 27.2	120 59.5	0	12.5	..	...	. .	....
3625	5:30 a.m.	$84_{(11)}$	35 27.0	121 0.1	0	12.5	....	.....	... .	...
3626	6:00 a.m.	(85_{12})	35 28.4	121 2.6	0	12.2	....	.. ..	.. ..	. ....
3627	7:00 a.m.	(86_{11})	35 33.5	121 8.7	0	11.8	.	.....	.. .	. ....
3628	8:00 a.m.	(87_{11})	35 39.0	121 16.0	0	11.8	.... .	. .	. ....	. ....
3629	9:00 a.m.	(88_{10})	35 42.8	121 20.0	0	11.4	.....	.....	. . .	.
3630	10:00 a.m.	(89_{10})	35 48.2	121 23.0	0	11.9	.... .	.....	....	

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: $S\frac{0°}{4°0}$	Specific gravity: $S\frac{17°5}{17°5}$	Specific gravity: $S\frac{t°}{4°0}$	Salinity $S^{0}/_{00}$
				Aug. 19, 1912						
3631	11:00 a.m.	(90_{47})	35° 55.0	121° 29.0	0	12.4	.....	.....	.....	.....
3632	12:01 p.m.	(91_{48})	36 0.5	121 34.7	0	12.2	.....	.....	.....	.....
3633	1:00 p.m.	(92_{49})	36 6.0	121 38.7	0	12.3	.....	.....	.....	.....
3634	2:00 p.m.	(93_{50})	36 12.2	121 46.0	0	12.4	.....	.....	.....	.....
3635	3:00 p.m.	(95_{51})	36 16.0	121 52.7	0	11.6	.....	.....	.....	.....
3636	4:00 p.m.	(95_{53})	36 23.0	121 55.5	0	11.4	.....	.....	.....	.....
3637	5:00 p.m.	96_{54}	36 31.3	121 58.0	0	10.5	.....	.....	.....	.....
3638	6:03 p.m.	95_{55}	36 38.3	121 57.0	0	12.0	.....	.....	.....	.....
				Aug. 20, 1912						
3639	5:00 a.m.	(95_{55})	36 36.3	121 52.7	0	11.2	.....	.....	.....	.....
3640	6:00 a.m.	95_{57}	36 44.0	121 55.0	0	11.8	.....	.....	.....	.....
3641	7:00 a.m.	95_{58}	36 50.5	121 57.0	0	11.7	.....	.....	.....	.....
3642	8:00 a.m.	$97_{(59)}$	36 56.8	122 3.2	0	13.0	.....	.....	.....	.....
3643	9:00 a.m.	(98_{60})	36 59.0	122 11.3	0	12.5	.....	.....	.....	.....
3644	10:00 a.m.	(99_{61})	37 4.8	122 17.0	0	12.7	.....	.....	.....	.....
3645	11:00 a.m.	(100_{62})	37 9.0	122 22.0	0	12.3	.....	.....	.....	.....
3646	12:01 p.m.	$(101)_{63}$	37 16.0	122 25.9	0	12.0	.....	.....	.....	.....
3647	1:00 p.m.	$(101)_{64}$	37 21.1	122 25.2	0	11.9	.....	.....	.....	.....
3648	2:00 p.m.	(102_{66})	37 28.9	122 30.0	0	12.8	.....	.....	.....	.....
3649	3:00 p.m.	(102_{67})	37 32.4	122 31.3	0	12.8	.....	.....	.....	.....
3650	4:15 p.m.	(102_{68})	37 40.0	122 31.3	0	12.5	.....	.....	.....	.....
3651	5:05 p.m.	(102_{69})	37 45.8	122 31.7	0	12.4	.....	.....	.....	.....
				Aug. 23, 1912						
3652	11:00 a.m.	(102_{70})	37 49.1	122 28.0	0	15.6	.....	.....	.....	.....
3653	12:01 p.m.	(103_{70})	37 50.5	122 37.0	0	13.4	.....	.....	.....	.....
				Aug. 24, 1912						
3654	5:00 a.m.	(104_{71})	37 53.0	122 39.5	0	11.4	.....	.....	.....	.....
3655	6:00 a.m.	(105_{71})	37 56.5	122 46.0	0	10.2	.....	.....	.....	.....
3656	7:00 a.m.	(106_{72})	37 57.9	122 52.0	0	9.8	.....	.....	.....	.....
3657	8:00 a.m.	(107_{72})	37 58.5	122 56.7	0	10.3	.....	.....	.....	.....
3658	9:00 a.m.	(108_{72})	37 59.0	123 1.4	0	12.8	.....	.....	.....	.....
3659	10:00 a.m.	$(108)_{74}$	38 7.3	122 58.0	0	12.0	.....	.....	.....	.....
3660	11:00 a.m.	(108_{75})	38 14.3	123 0.0	0	12.4	.....	.....	.....	.....
3661	12:01 p.m.	(109_{76})	38 17.7	123 4.1	0	12.4	.....	.....	.....	.....
3662	1:00 p.m.	(109_{77})	38 22.7	123 6.9	0	12.4	.....	.....	.....	.....
3663	2:00 p.m.	(110_{78})	38 28.1	123 11.2	0	11.3	.....	.....	.....	.....
3664	3:00 p.m.	(111_{78})	38 30.5	123 14.8	0	11.0	.....	.....	.....	.....
3665	4:00 p.m.	(111_{78})	38 30.5	123 14.8	0	11.0	.....	.....	.....	.....
3666	5:00 p.m.	(111_{78})	38 30.5	123 14.8	0	11.0	.....	.....	.....	.....
3667	6:00 p.m.	(111_{78})	38 30.5	123 14.8	0	11.0	.....	.....	.....	.....
				Aug. 25, 1912						
3668	5:00 a.m.	(111_{79})	38 30.5	123 14.8	0	11.0	.....	.....	.....	.....
3669	6:00 a.m.	(112_{79})	38 33.4	123 20.0	0	11.4	.....	.....	.....	.....
3670	7:00 a.m.	(112_{79})	38 35.7	123 21.7	0	12.3	.....	.....	.....	.....
3671	8:00 a.m.	114_{80}	38 42.2	123 28.3	0	13.5	.....	.....	.....	.....
3672	9:00 a.m.	(115_{81})	38 46.2	123 33.1	0	13.6	.....	.....	.....	.....
3673	10:00 a.m.	(116_{82})	38 50.0	123 38.2	0	15.2	.....	.....	.....	.....
3674	11:00 a.m.	$(117)_{83.5}$	38 57.5	123 45.0	0	15.0	.....	.....	.....	.....
3675	12:01 p.m.	116_{84}	39 0.7	123 42.4	0	16.4	.....	.....	.....	.....
3676	1:00 p.m.	$(117)_{85}$	39 7.3	123 44.2	0	15.6	.....	.....	.....	.....
3677	2:00 p.m.	(117_{87})	39 13.6	123 47.3	0	15.6	.....	.....	.....	.....
				Aug. 26, 1912						
3678	5:22 a.m.	(118_{87})	39 17.8	123 47.8	0	11.6	.....	.....	.....	.....
3679	1:00 p.m.	(122_{97})	40 6.9	124 9.1	0	12.0	.....	.....	.....	.....
3680	2:00 p.m.	(123_{98})	40 10.6	124 15.5	0	12.3	.....	.....	.....	.....
3681	3:00 p.m.	(124_{99})	40 15.0	124 21.8	0	11.2	.....	.....	.....	.....
3682	4:00 p.m.	$(125)_{101}$	40 23.8	124 24.0	0	11.0	.....	.....	.....	.....
3683	5:00 p.m.	$(125)_{102}$	40 28.6	124 26.5	0	11.5	.....	.....	.....	.....
3684	6:00 p.m.	(124_{103})	40 34.3	124 22.0	0	12.4	.....	.....	.....	.....
				Aug. 28, 1912						
3685	4:00 a.m.	(122_{106})	40 48.0	124 10.0	0	11.9	.....	.....	.....	.....
3686	7:00 a.m.	125_{105}	40 46.5	124 24.8	0	12.0	.....	.....	.....	.....
3687	8:00 a.m.	(122_{105})	40 44.0	124 10.0	0	12.2	.....	.....	.....	.....
3688	9:00 a.m.	(121_{108})	41 1.2	124 7.4	0	12.5	.....	.....	.....	.....
3689	10:00 a.m.	(122_{109})	41 5.5	124 11.0	0	12.2	.....	.....	.....	.....

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position		Depth in meters	Temperature in centigrade	Specific gravity			Salinity S ‰
			North latitude	West longitude			0° S 4°0	17°5 S 17°5	t° S 4°0	
				Aug. 28, 1912						
3690	11:00 a.m.	$(122)_{111}$	41° 13'3	124° 7'8	0	12°8				
3691	12:01 p.m.	(121_{112})	41 19.5	124 5.8	0	13.8				
3692	1:00 p.m.	(121_{114})	41 28.5	124 5.0	0	14.6				
3693	2:00 p.m.	121_{115}	41 34.7	124 7.2	0	14.8				
3694	3:00 p.m.	(122_{117})	41 44.2	124 11.8	0	15.4				
3695	4:00 p.m.	(122_{117})	41 44.0	124 11.0	0	11.8				
				Aug. 29, 1912						
3696	7:00 a.m.	$(123)_{118}$	41 50.5	124 15.0	0	11.8				
3697	8:00 a.m.	$(123)_{119}$	41 56.8	124 14.0	0	11.7				
3698	9:00 a.m.	(123.5_{120})	42 0.2	124 17.5	0	11.7				
3699	10:00 a.m.	125_{122}	42 8.4	124 23.3	0	11.9				
3700	11:00 a.m.	125_{123}	42 14.7	124 25.5	0	11.9				
3701	12:01 p.m.	125_{125}	42 22.7	124 27.0	0	12.7				
3702	1:00 p.m.	126_{126}	42 28.0	124 30.0	0	12.7				
3703	2:00 p.m.	125_{127}	42 35.6	124 25.3	0	12.7				
3704	3:00 p.m.	126_{128}	42 42.0	124 28.4	0	11.3				
3705	3:15 p.m.	126_{129}	42 44.0	124 30.5	0	11.2				
3706	4:00 p.m.	126_{129}	42 44.0	124 30.0	0	11.3				
				Aug. 30, 1912						
3707	6:00 a.m.	126.5_{129}	42 45.8	124 32.5	0	11.4				
3708	7:00 a.m.	127_{130}	42 50.7	124 36.0	0	11.6				
3709	8:00 a.m.	126_{132}	42 58.0	124 29.5	0	12.2				
3710	9:00 a.m.	125_{133}	43 5.3	124 27.0	0	12.2				
3711	10:00 a.m.	125_{134}	43 12.0	124 25.5	0	12.4				
3712	11:00 a.m.	125_{136}	43 19.0	124 25.5	0	12.2				
				Sept. 4, 1912						
3713	11:00 a.m.	(123_{137})	43 23.7	124 17.3	0	15.1				
3714	12:01 p.m.	(123_{137})	43 23.7	124 17.3	0	16.2				
3715	1:00 pm..	(123_{137})	43 23.7	124 17.3	0	15.9				
3716	2:00 p.m.	124_{136}	43 21.2	124 20.0	0	14.9				
3717	3:00 p.m.	126_{137}	43 26.2	124 28.5	0	15.2				
3718	4:00 p.m.	123_{139}	43 33.5	124 15.5	0	14.5				
3719	5:00 p.m.	123_{140}	43 39.0	124 14.0	0	14.2				
3720	6:00 p.m.	122_{142}	43 48.0	124 12.0	0	14.4				
				Sept. 5, 1912						
3721	4:00 a.m.	121_{158}	45 0.0	124 4.0	0	14.2				
				Sept. 6, 1912						
3722	9:00 a.m.	(118_{170})	46 11.5	123 51.0	0	15.8				
				Sept. 7, 1912						
3723	9:00 a.m.	(118_{170})	46 11.5	123 51.0	0	15.8				
3724	12:01 p.m.	(118_{170})	46 11.5	123 51.0	0	15.6				
3725	3:00 p.m.	(118_{170})	46 11.5	123 51.0	0	15.6				
				Sept. 8, 1912						
3726	9:00 a.m.	(118_{170})	46 11.5	123 51.0	0	15.6				
				Sept. 9, 1912						
3727	11:00 a.m.	$(129)_{171}$	46 14.7	124 1.5	0	15.8				
3728	12:01 p.m.	121_{171}	46 14.0	124 6.3	0	15.8				
3729	1:00 p.m.	121_{172}	46 19.5	124 5.0	0	15.8				
3730	2:00 p.m.	121_{173}	46 23.0	125 5.0	0	15.8				
3731	3:00 p.m.	121_{174}	46 29.5	124 5.0	0	14.8				
3732	4:00 p.m.	121_{175}	46 33.0	124 7.0	0	14.6				
3733	5:00 p.m.	122_{176}	46 41.5	124 10.5	0	14.2				
3734	6:00 p.m.	122_{177}	46 45.0	124 10.0	0	14.4				
				Sept. 10, 1912						
3735	4:00 a.m.	127_{189}	47 44.5	124 33.0	0	14.5				
3736	6:00 a.m.	128_{191}	47 55.0	124 41.0	0	14.5				
3737	7:00 a.m.	129_{192}	48 6.5	124 44.5	0	14.5				
3738	8:00 a.m.	129_{194}	48 11.5	124 46.5	0	14.2				
3739	9:00 a.m.	129_{195}	48 15.0	124 43.6	0	14.4				
3740	10:00 a.m.	129_{197}	48 22.7	124 45.0	0	14.2				
3741	11:00 a.m.	127_{197}	48 23.7	124 36.4	0	12.8				
3742	12:01 p.m.	$(127_{196.5})$	48 22.5	124 36.0	0	13.7				
3743	1:00 p.m.	$(127_{196.5})$	48 22.5	124 36.0	0	13.7				
				Sept. 11, 1912						
3744	4:00 a.m.	$(127_{196.5})$	48 22.5	124 36.0	0	10.4				
3745	6:00 a.m.	129_{197}	48 23.7	124 44.7	0	10.4				
3746	7:00 a.m.	129_{195}	48 17.0	124 47.0	0	14.1				

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: S 0°/4°C	Specific gravity: S 17°.5/17°.5	Specific gravity: S t°/4°C	Salinity S ‰
				Sept. 11, 1912						
3747	8:00 a.m.	130_{194}	48° 10.0	124° 49.2	0	14°.5				
3748	9:00 a.m.	129_{193}	48 5.0	124 46.0	0	14.5				
3749	10:00 a.m.	$128.5_{1.1}$	47 55.7	124 42.5	0	14.4				
3750	11:00 a.m.	128_{190}	47 51.5	124 40.0	0	15.2				
3751	12:01 p.m.	127_{189}	47 46.0	124 33.0	0	16.4				
3752	1:00 p.m.	125_{188}	47 38.0	124 27.0	0	16.2				
3753	2:00 p.m.	125_{187}	47 27.0	124 25.0	0	16.2				
3754	3:00 p.m.	124_{185}	47 17.0	124 19.5	0	16.2				
3755	4:00 p.m.	(121_{182})	47 9.0	124 6.0	0	16.2				
3756	5:00 p.m.	(121_{181})	47 7.0	124 6.0	0	15.6				
3757	6:00 p.m.	$(122)_{180}$	47 1.0	124 11.5	0	15.6				
3758	7:00 p.m.	123_{179}	46 55.0	124 14.0	0	15.6				
3759	9:00 p.m.	123_{178}	46 50.0	124 14.0	0	15.5				
3760	11:59 p.m.	122_{175}	46 35.0	124 10.0	0	15.5				
				Sept. 12, 1912						
3761	4:00 a.m.	120_{170}	46 10.0	124 0.3	0	14.0				
3762	5:00 a.m.	120_{168}	46 1.0	123 59.0	0	14.0				
3763	6:00 a.m.	$(120)_{168.5}$	45 52.5	124 0.5	0	14.5				
3764	7:00 a.m.	120_{167}	45 46.5	124 0.0	0	14.6				
3765	8:00 a.m.	120_{166}	45 40.0	123 59.0	0	14.4				
3766	9:00 a.m.	120_{165}	45 34.0	123 59.0	0	14.7				
3767	10:00 a.m.	(120_{161})	45 26.5	124 0.0	0	14.8				
3768	11:00 a.m.	(120_{160})	45 20.5	124 2.0	0	14.8				
3769	12:01 p.m.	(120_{159})	45 13.0	124 1.0	0	14.9				
3770	1:00 p.m.	(120_{157})	45 7.0	124 0.5	0	15.2				
3771	2:00 p.m.	(120.5_{156})	45 2.0	124 2.5	0	15.2				
3772	3:00 p.m.	121_{155}	44 55.5	124 4.0	0	15.0				
3773	4:00 p.m.	$(121)_{154}$	44 49.0	124 6.5	0	14.8				
3774	5:00 p.m.	$(121)_{152}$	44 42.0	124 6.5	0	14.0				
3775	6:00 p.m.	121_{150}	44 31.0	124 7.0	0	14.0				
				Sept. 13, 1912						
3776	4:00 a.m.	$(124)_{137}$	43 26.0	124 20.0	0	11.8				
3777	6:00 a.m.	126_{133}	43 4.5	124 30.0	0	12.0				
3778	7:00 a.m.	127_{131}	42 57.3	124 33.0	0	10.4				
3779	9:00 a.m.	126_{128}	42 40.5	124 32.0	0	12.0				
3780	10:00 a.m.	126_{127}	42 33.0	124 30.0	0	11.8				
3781	11:00 a.m.	127_{125}	42 25.5	124 33.0	0	12.8				
3782	12:01 p.m.	126_{124}	42 18.0	124 28.0	0	14.4				
3783	1:00 p.m.	125_{122}	42 10.5	124 25.0	0	14.6				
3784	2:00 p.m.	124_{121}	42 3.0	124 20.5	0	14.8				
3785	3:00 p.m.	$(123)_{119}$	41 57.0	124 17.0	0	14.8				
3786	4:00 p.m.	$(123)_{118}$	41 51.0	124 16.0	0	15.6				
3787	5:00 p.m.	(122_{117})	41 45.0	124 11.0	0	15.6				
3788	6:00 p.m.	(122_{117})	41 45.0	124 11.0	0	15.4				
				Sept. 16, 1912						
3789	4:00 p.m.	(123_{105})	40 45.0	124 16.0	0	13.5				
3790	5:00 p.m.	(124_{104})	40 38.0	124 22.0	0	14.5				
3791	6:00 p.m.	$(125)_{102}$	40 31.0	124 26.0	0	13.8				
3792	7:00 p.m.	125_{100}	40 22.0	124 24.0	0	10.4				
				Sept. 17, 1912						
3793	4:00 a.m.	$(118)_{51}$	39 34.6	123 49.0	0	11.4				
3794	6:00 a.m.	(118_{50})	39 21.0	123 50.0	0	11.4				
3795	7:00 a.m.	118_{57}	39 14.3	123 48.0	0	11.4				
3796	8:00 a.m.	$(117_{57.5})$	39 7.5	123 44.0	0	10.9				
3797	9:00 a.m.	117_{58}	39 0.7	123 44.0	0	11.8				
3798	10:00 a.m.	$(117)_{58}$	38 53.9	123 43.0	0	12.6				
3799	11:00 a.m.	(115_{58})	38 47.1	123 37.0	0	14.0				
3800	12:01 p.m.	(113_{58})	38 40.3	123 27.0	0	14.3				
3801	1:00 p.m.	(112_{58})	38 33.5	123 21.0	0	15.0				
3802	2:00 p.m.	(110_{58})	38 26.7	123 11.5	0	15.5				
3803	3:00 p.m.	(109_{58})	38 19.9	123 3.5	0	15.0				
3804	4:00 p.m.	(108_{58})	38 13.1	123 0.0	0	15.1				
3805	5:00 p.m.	(108_{58})	38 6.3	123 0.0	0	14.8				
3806	6:00 p.m.	(108.5_{58})	37 59.5	123 2.5	0	14.9				
3807	7:00 p.m.	(105_{58})	37 53.0	122 45.0	0	14.4				

TABLE 1.—OCEAN DATA—(*Concluded*)

Water sample number	Time of day	Section	Position		Depth in meters	Temperature in centigrade	Specific gravity			Salinity S ‰
			North latitude	West longitude			0° S 4°0	17°5 S 17°5	t° S 4°0	
				Sept. 20, 1912						
3808	9:00 a.m.	$(102_{(95)})$	37° 47.5	122° 31.0	0	15°0	.....	.....	.....	.....
3809	10:00 a.m.	(102_{96})	37 40.0	122 31.5	0	15.0	.....	.....	.....	.....
3810	11:00 a.m.	(102.5_{97})	37 33.0	122 32.5	0	15.6	.....	.....	.....	.....
3811	12:01 p.m.	103_{98}	37 26.0	122 29.0	0	15.0	.....	.....	.....	
3812	1:00 p.m.	$(101)_{94}$	37 19.0	122 26.0	0	14.7	.....	.....	.....	..
3813	2:00 p.m.	$(101)_{92}$	37 12.0	122 26.0	0	13.6	.....	.....	.....	.....
3814	3:00 p.m.	$(100)_{91}$	37 5.0	122 20.0	0	13.6	.....	.....	.....	.....
3815	4:00 p.m.	98_{89}	36 57.0	122 12.0	0	12.9	.....	.....	.....	
3816	5:00 p.m.	$97_{(89)}$	36 56.0	122 4.0	0	14.2	.....	.....	.....	
				Sept. 22, 1912						
3817	7:00 a.m.	96_{85}	36 34.0	122 0.0	0	13.0	.....	.....	.....	
3818	8:00 a.m.	96_{84}	36 30.0	121 59.0	0	12.0	.....	.....	.....	
3819	9:00 a.m.	(95.5_{83})	36 26.7	121 57.5	0	13.2	.....	.....	.....	
3820	10:00 a.m.	$(95)_{82}$	36 19.0	121 55.5	0	11.3	.....	.....	.....	
3821	11:00 a.m.	(94_{81})	36 13.0	121 50.0	0	12.2	.....	.....	.....	.....
3822	12:01 p.m.	(92_{80})	36 7.0	121 42.0	0	12.6	.....	.....	.....	.....
3823	1:00 p.m.	(91_{78})	36 1.0	121 35.5	0	13.4	.....	.....	.....	.....
3824	2:00 p.m.	(90_{77})	35 55.0	121 30.0	0	13.5	.....	.....	.....	.....
3825	3:00 p.m.	(89_{76})	35 49.0	121 25.0	0	13.2	.....	.....	.....	.....
3826	4:00 p.m.	(88_{75})	35 43.0	121 21.0	0	13.1	.....	.....	.....	.....
3827	5:00 p.m.	87_{74}	35 37.0	121 14.0	0	13.3	.....	.....	.....	.....
3828	6:00 p.m.	(85_{72})	35 31.0	121 7.0	0	14.0	.....	.....	.....	.....
				Sept. 23, 1912						
3829	7:00 a.m.	81_{70}	34 31.3	120 45.0	0	15.4	.....	.....	.....	.....
3830	8:00 a.m.	(78.5_{69})	34 28.0	120 32.5	0	14.2	.....	.....	.....	.....
3831	9:00 a.m.	$75_{(70)}$	34 24.7	120 20.0	0	15.4	.....	.....	.....	.....
3832	10:00 a.m.	73_{68}	34 21.5	120 7.4	0	16.0	.....	.....	.....	.....
3833	11:00 a.m.	71_{67}	34 18.2	119 54.0	0	15.6	.....	.....	.....	.....
3834	12:01 p.m.	68_{67}	34 15.0	119 42.0	0	16.0	.....	.....	.....	.....
3835	1:00 p.m.	67_{67}	34 13.5	119 36.5	0	16.5	.....	.....	.....	.....
3836	2:00 p.m.	66_{66}	34 12.0	119 31.0	0	16.4	.....	.....	.....	.....
3837	3:00 p.m.	65_{66}	34 10.5	119 25.5	0	16.4	.....	.....	.....	.....
3838	4:00 p.m.	64_{66}	34 9.0	119 20.0	0	16.3	.....	.....	.....	.....
3839	5:00 p.m.	(63_{66})	34 8.0	119 16.0	0	16.6	.....	.....	.....	.....
3840	6:00 p.m.	(60_{65})	34 6.0	119 10.0	0	15.8	.....	.....	.....	.....

EXPLANATION OF TABLE 2, PART A

The observations of temperature and the determinations of specific gravity and salinity tabulated in this part were all made by Wm. T. Skilling, Professor of Physics and Physical Geography in the San Diego Normal School, by means of a salinometer purchased from Queen and Co., Philadelphia. The hydrometer was graduated to 0.001 and the specific gravity was estimated to 0.0001. As the instrument was lost before being calibrated, and as the specific gravities were found to be systematically lower by approximately 0.0008 than those determined since 1908 relative to the same locations, they have been increased by this amount. This may, therefore, be regarded as a very crude calibration correction and, while the results are tabulated to 0.0001, the average error is doubtless three or four times as great. The results, in spite of the large error involved, clearly reveal the difference in seasonal variation in salinity between the bay and the ocean.

First column.—Water sample numbers entered with respect first to location, second to time.

Second column.—Date.

Third column.—Time when the sample was collected entered to the nearest minute.

Fourth column.—Temperature *in situ.*

Fifth, sixth, and seventh columns.—Specific gravity of sample under atmospheric pressure, the 1.0 being omitted; for meaning of symbols see page 48.

Eighth column.—Salinity *per mille* determined with a salinometer as described above.

TABLE 2.—DATA RELATIVE TO SAN DIEGO BAY

Part A—Preliminary Observations

Surface Observations made from Coronado Pier, 32° 40.4 N 117° 10.7 W

Water sample number	Date	Time of day	Temperature in centigrade	Specific gravity $S\frac{0°}{4°0}$	Specific gravity $S\frac{17°5}{17°5}$	Specific gravity $S\frac{t°}{4°0}$	Salinity $S\,^0/_{00}$
	1903						
B 1	June 28	12:35 p.m.	19°9	.....	.....	.....	.....
B 2	June 28	6:00 p.m.	20.5	.....	.....	.....	.....
B 3	June 29	6:42 a.m.	17.8	.....	.....	.....	.....
B 4	June 29	1:10 p.m.	19.7	.....	.....	.....	.....
B 5	June 30	7:45 a.m.	19.0	.....	.....	.....	.....
B 6	June 30	2:00 p.m.	20.7	.....	.....	.....	.....
B 7	June 30	9:30 p.m.	20.3	.....	.....	.....	.....
B 8	July 1	8:18 a.m.	19.5	275	261	243	34.2
B 9	July 1	3:00 p.m.	21.3	275	261	238	34.2
B 10	July 1	11:00 p.m.	20.5	274	260	240	34.1
B 11	July 2	9:00 a.m.	18.1	.....	.....	.....	.....
B 12	July 2	4:15 p.m.	21.6	.....	.....	.....	.....
B 13	July 2	9:30 p.m.	21.0	271	258	235	33.7
B 14	July 3	10:20 a.m.	21.5	.....	.....	.....	.....
B 15	July 5	6:00 p.m.	20.0	270	257	237	33.6
B 16	July 6	1:20 p.m.	20.4	.....	.....	.....	.....
B 17	July 6	7:30 p.m.	19.8	274	260	242	34.1
B 18	July 7	3:00 p.m.	22.0	.....	.....	.....	.....
B 19	July 7	7:10 p.m.	21.4	276	262	239	34.3
B 20	July 11	10:50 a.m.	18.0	271	258	243	33.7
B 21	July 13	1:00 p.m.	19.0	.....	.....	.....	.....
B 22	July 13	6:00 p.m.	18.5	.....	.....	.....	.....
B 23	July 15	8:00 a.m.	19.5	.....	.....	.....	.....
B 24	July 15	11:00 p.m.	20.5	270	257	236	33.6
B 25	July 16	1:00 p.m.	22.5	.....	.....	.....	.....
B 26	July 18	4:00 p.m.	21.5	.....	.....	.....	.....
B 27	July 20	1:30 p.m.	21.0	.....	.....	.....	.....
B 28	July 20	6:00 p.m.	21.5	.....	.....	.....	.....
B 29	July 21	9:30 a.m.	20.2	.....	.....	.....	.....
B 30	July 21	2:30 p.m.	22.0	.....	.....	.....	.....
B 31	July 22	8:40 a.m.	19.5	.....	.....	.....	.....
B 32	July 22	2:30 p.m.	22.5	274	260	234	34.1
B 33	July 22	8:30 p.m.	18.6	273	259	243	34.0
B 34	July 23	8:30 a.m.	18.2	272	259	244	33.8
B 35	July 23	1:40 p.m.	20.2	275	261	242	34.2
B 36	July 23	8:30 p.m.	17.7	271	258	244	33.7
B 37	July 25	11:40 a.m.	20.0	273	259	240	34.0
B 38	July 25	5:20 p.m.	21.5	272	259	235	33.8
B 39	July 27	10:00 a.m.	16.2	272	259	248	33.8
B 40	July 27	11:00 p.m.	14.8	270	257	250	33.6
B 41	July 28	9:10 a.m.	16.0	269	256	246	33.5
B 42	July 28	12:30 p.m.	17.5	.....	.....	.....	.....
B 43	July 29	8:40 a.m.	15.9	268	255	245	33.4
B 44	July 29	1:15 p.m.	18.5	269	256	240	33.5
B 45	July 30	8:15 a.m.	16.5	269	256	245	33.5
B 46	July 30	2:10 p.m.	19.4	271	258	240	33.7
B 47	July 31	8:45 a.m.	18.2	271	258	242	33.7
B 48	July 31	3:20 p.m.	21.0	270	257	234	33.6
B 49	Aug. 1	9:50 a.m.	19.6	274	260	242	34.1
B 50	Aug. 1	4:20 p.m.	21.4	275	261	238	34.2
B 51	Dec. 21	10:45 a.m.	14.6	270	257	250	33.6
B 52	Dec. 22	10:30 a.m.	14.8	269	256	249	33.5
B 53	Dec. 23	11:15 a.m.	15.0	267	254	246	33.2
B 54	Dec. 25	5:00 p.m.	15.1	269	256	248	33.5
B 55	Dec. 26	3:45 p.m.	15.6	270	257	248	33.6
B 56	Dec. 28	1:35 p.m.	15.5	270	257	248	33.6
B 57	Dec. 29	11:20 a.m.	14.7	270	257	250	33.6
B 58	Dec. 31	2:00 p.m.	15.4	269	256	247	33.5
	1904						
B 59	Jan. 1	4:40 p.m.	15.5	269	256	247	33.5
B 60	Jan. 2	3:00 p.m.	15.5	270	257	248	33.6

Table 2.—Data Relative to San Diego Bay—(*Continued*)

Part A—Preliminary Observations

Surface Observations made from Coronado Pier, 32° 40.4 N 117° 10.7 W

Water sample number	Date 1904	Time of day	Temperature in centigrade	Specific gravity $S\frac{0°}{4°0}$	Specific gravity $S\frac{17°5}{17°5}$	Specific gravity $S\frac{t°}{4°0}$	Salinity S ‰
B 61	May 27	4:40 p.m.	21°2	270	257	234	33.6
B 62	May 28	4:30 p.m.	20.8	269	256	234	33.5
B 63	June 2	11:00 a.m.	19.9	273	259	240	34.0
B 64	June 4	4:40 p.m.	20.2	271	258	238	33.7
B 65	June 6	10:40 a.m.	19.4	271	258	240	33.7
B 66	June 7	4:50 p.m.	21.2	270	257	234	33.6
B 67	June 8	4:25 p.m.	21.6	272	259	235	33.8
B 68	June 9	4:25 p.m.	22.0	271	258	233	33.7
B 69	June 10	4:30 p.m.	22.4	271	258	232	33.7
B 70	June 11	4:00 p.m.	21.7	.....	.....	.....	.....
B 71	June 12	3:45 p.m.	22.5	271	258	231	33.7
B 72	June 14	4:45 p.m.	22.0	.....	.....	.....	.....
B 73	June 15	4:15 p.m.	19.0	271	258	241	33.7
B 74	June 16	4:00 p.m.	19.8	275	261	243	34.2
B 75	June 17	4:00 p.m.	18.0	269	256	241	33.5
B 76	June 18	4:25 p.m.	19.3	269	256	238	33.5
B 77	June 20	4:00 p.m.	19.5	269	256	237	33.5
B 78	June 21	4:00 p.m.	20.5	270	257	236	33.6
B 79	June 22	4:00 p.m.	19.9	269	256	237	33.5
B 80	June 23	4:15 p.m.	20.0	270	257	237	33.6
B 81	June 24	4:00 p.m.	20.2	272	259	239	33.8
B 82	June 25	4:00 p.m.	20.9	274	260	239	34.1
B 83	June 27	4:00 p.m.	20.4	275	261	241	34.2
B 84	June 28	4:10 p.m.	20.5	274	260	240	34.1
B 85	June 29	4:00 p.m.	19.2	272	259	241	33.8
B 86	June 30	4:00 p.m.	17.2	.....	.....	.....	.....
B 87	July 1	4:00 p.m.	19.0	.....	.....	.....	.....
B 88	July 2	4:00 p.m.	19.8	275	261	243	34.2
B 89	July 3	4:00 p.m.	19.5	273	259	241	34.0
B 90	July 4	5:50 p.m.	20.0	275	261	242	34.2
B 91	July 5	4:00 p.m.	20.5	272	259	238	33.8
B 92	July 6	4:10 p.m.	21.5	274	260	237	34.1
B 93	July 7	5:15 p.m.	21.5	274	260	237	34.1
B 94	July 8	4:40 p.m.	22.5	.....	.....	.....	.....
B 95	July 9	4:00 p.m.	20.5	.....	.....	.....	.....
B 96	July 10	4:00 p.m.	16.0	270	257	247	33.6
B 97	July 11	4:00 p.m.	17.0	274	260	249	34.1
B 98	July 12	4:00 p.m.	19.2	273	259	242	34.0
B 99	July 13	4:00 p.m.	20.0	272	259	239	33.8
B 100	July 14	4:00 p.m.	21.0	275	261	239	34.2
B 101	July 17	4:00 p.m.	22.0	.....	.....	.....	.....
B 102	July 18	4:00 p.m.	22.0	.....	.....	.....	.....
B 103	July 19	4:20 p.m.	21.4	276	262	239	34.3
B 104	July 20	4:10 p.m.	21.0	273	259	237	34.0
B 105	July 21	4:20 p.m.	21.5	272	259	235	33.8
B 106	July 22	4:15 p.m.	22.4	274	260	235	34.1
B 107	July 23	4:10 p.m.	20.5	271	258	237	33.7
B 108	July 24	5:20 p.m.	20.5	274	260	240	34.1
B 109	July 25	4:20 p.m.	21.2	271	258	235	33.7
B 110	July 26	4:20 p.m.	22.5	274	260	234	34.1
B 111	July 27	5:10 p.m.	23.5	.....	.....	.....	.....
B 112	July 29	5:25 p.m.	23.0	274	260	233	34.1

Surface Observations made in Glorietta Bight, 32° 40.6 N, 117° 10.0 W

	1903						
B 113	June 28	12:45 p.m.	23°9	289	275	244	36.0
B 114	June 28	6:00 p.m.	24.4	287	273	241	35.7
B 115	June 29	7:00 a.m.	22.6	285	271	245	35.5
B 116	June 29	1:30 p.m.	22.3	282	268	242	35.1
B 117	June 30	7:45 a.m.	22.3	.....	.....	.....	.....

TABLE 2.—DATA RELATIVE TO SAN DIEGO BAY—(*Continued*)

Part A—Preliminary Observations

Surface Observations made in Glorietta Bight, 32° 40.6 N, 117° 10.0 W

Water sample number	Date 1903	Time of day	Temperature in centigrade	Specific gravity $S\frac{0°}{4°0}$	Specific gravity $S\frac{17°5}{17°5}$	Specific gravity $S\frac{t°}{4°0}$	Salinity S ‰
B 118	June 30	2:00 p.m.	24°0	283	269	238	35.2
B 119	June 30	9:30 p.m.	23.5	284	270	241	35.3
B 120	July 1	8:30 a.m.	22.6	287	273	246	35.7
B 121	July 1	3:00 p.m.	23.4	289	275	246	36.0
B 122	July 1	11:00 p.m.	23.5	286	272	243	35.6
B 123	July 2	9:30 a.m.	23.2	280	266	236	34.8
B 124	July 2	4:30 p.m.	23.7	283	269	240	35.2
B 125	July 2	9:30 p.m.	23.6	282	268	239	35.1
B 126	July 3	10:20 a.m.	24.5	286	272	240	35.6
B 127	July 3	5:30 p.m.	24.6	285	271	239	35.5
B 128	July 3	9:30 p.m.	24.0	281	267	236	35.0
B 129	July 4	8:00 a.m.	22.6	283	269	242	35.2
B 130	July 5	1:00 p.m.	23.9	283	269	239	35.2
B 131	July 5	6:00 p.m.	24.9	280	266	232	34.8
B 132	July 6	1:30 p.m.	25.0	284	270	236	35.3
B 133	July 6	7:30 p.m.	24.3	281	267	235	35.0
B 134	July 7	3:00 p.m.	25.0	285	271	237	35.5
B 135	July 7	7:30 p.m.	24.8	283	269	236	35.2
B 136	July 11	10:40 a.m.	25.3	284	270	235	35.3
B 137	July 13	1:00 p.m.	24.5	286	272	239	35.6
B 138	July 13	6:00 p.m.	26.7	286	272	233	35.6
B 139	July 16	9:00 a.m.	26.4	.....	.....	.....	.....
B 140	July 16	2:20 p.m.	26.6	286	272	233	35.6
B 141	July 17	8:15 a.m.	25.8	286	272	235	35.6
B 142	July 18	9:00 a.m.	26.0	284	270	233	35.3
B 143	July 18	4:15 p.m.	26.0	291	277	239	36.2
B 144	July 20	2:15 p.m.	25.3	290	276	241	36.1
B 145	July 20	6:15 p.m.	25.8	284	270	234	35.3
B 146	July 21	9:00 a.m.	24.0	288	274	243	35.8
B 147	July 21	1:00 p.m.	24.4	288	274	241	35.8
B 148	July 22	8:30 a.m.	23.8	288	274	243	35.8
B 149	July 22	2:40 p.m.	26.3	288	274	236	35.8
B 150	July 22	8:00 p.m.	25.4	285	271	236	35.5
B 151	July 23	9:00 a.m.	24.6	286	272	239	35.6
B 152	July 23	2:00 p.m.	25.7	290	276	240	36.1
B 153	July 23	8:00 p.m.	25.4	285	271	236	35.5
B 154	July 24	1:30 p.m.	26.0	284	270	233	35.3
B 155	July 25	11:20 a.m.	25.0	284	270	236	35.3
B 156	July 25	4:10 p.m.	26.5	285	271	232	35.5
B 157	July 26	7:00 a.m.	24.0	285	271	240	35.5
B 158	July 27	10:30 a.m.	23.8	282	268	238	35.1
B 159	July 27	9:00 p.m.	24.0	281	267	236	35.0
B 160	July 28	8:30 a.m.	23.0	282	268	240	35.1
B 161	July 28	1:00 p.m.	23.8	284	270	240	35.3
B 162	July 29	9:10 a.m.	23.9	284	270	239	35.3
B 163	July 29	1:45 p.m.	23.3	278	274	236	34.6
B 164	July 30	8:30 a.m.	22.7	282	268	241	35.1
B 165	July 30	2:40 p.m.	23.5	279	265	236	34.7
B 166	July 31	9:20 a.m.	22.8	283	269	242	35.2
B 167	July 31	4:00 p.m.	24.0	280	266	235	34.8
B 168	Aug. 1	10:20 a.m.	22.9	286	272	244	35.6
B 169	Aug. 1	4:50 p.m.	23.6	279	265	236	34.7
B 170	Dec. 19	10:45 a.m.	13.4	272	259	254	33.8
B 171	Dec. 21	10:15 a.m.	13.4	273	259	255	34.0
B 172	Dec. 22	9:50 a.m.	13.5	.....	.....	.....	.....
B 173	Dec. 23	10:45 a.m.	13.9	272	259	253	33.8
B 174	Dec. 25	4:00 p.m.	13.5	274	260	256	34.1
B 175	Dec. 26	4:15 p.m.	13.3	274	260	257	34.1
B 176	Dec. 28	4:00 p.m.	14.2	276	262	257	34.3
B 177	Dec. 28	4:30 p.m.	14.6	.....	.....	.....	.....

Table 2.—Data Relative to San Diego Bay—(*Continued*)

Part A—Preliminary Observations

Surface Observations made in Glorietta Bight, 32° 40.6 N, 117° 10.0 W

Water sample number	Date	Time of day	Temperature in centigrade	Specific gravity S 0°/4°.0	Specific gravity S 17°.5/17°.5	Specific gravity S t°/4°.0	Salinity S °/₀₀
	1903						
B 178	Dec. 29	11:40 a.m.	13°.4	276	262	258	34.3
B 179	Dec. 31	2:25 p.m.	14.5	275	261	255	34.2
	1904						
B 180	Jan. 2	2:40 p.m.	14.7	275	261	255	34.2
B 181	May 27	4:00 p.m.	24.0	285	271	240	35.5
B 182	May 28	4:00 p.m.	23.5	281	267	238	35.0
B 183	June 2	11:20 a.m.	23.2	281	267	239	35.0
B 184	June 4	4:15 p.m.	23.7	284	270	240	35.3
B 185	June 6	11:00 a.m.	24.0	284	270	239	35.3
B 186	June 7	4:25 p.m.	23.4	286	272	243	35.6
B 187	June 8	4:00 p.m.	24.0	283	269	238	35.2
B 188	June 9	4:00 p.m.	25.1	284	270	236	35.3
B 189	June 10	4:00 p.m.	27.3	286	272	231	35.6
B 190	June 11	4:15 p.m.	26.0	283	269	232	35.3
B 191	June 12	4:25 p.m.	25.3	282	268	233	35.1
B 192	June 14	4:25 p.m.	25.2	282	268	234	35.1
B 193	June 15	4:45 p.m.	25.1	284	270	236	35.3
B 194	June 16	4:30 p.m.	25.3	284	270	235	35.3
B 195	June 17	4:30 p.m.	25.0	283	269	235	35.2
B 196	June 18	4:35 p.m.	25.4	285	271	235	35.5

Surface Observations made from Glorietta Boat-house, 32° 40.7 N, 117° 10.5 W

	1904						
B 197	June 20	7:00 a.m.	23°.8	.....	.....	..	..
B 198	June 21	7:00 a.m.	22.2	.....	.....	....	....
B 199	June 21	4:00 p.m.	24.0	.....	.....		..
B 200	June 22	7:00 a.m.	23.0	.....	.....	.	..
B 201	June 22	4:00 p.m.	24.0	.....	.....	.	.
B 202	June 23	7:00 a.m.	23.0	.....	.....	....	.
B 203	June 23	4:00 p.m.	24.0	.....	.....	..	.
B 204	June 24	7:00 a.m.	23.0	.....	.....	..	
B 205	June 24	4:00 p.m.	24.2	.....	.....	...	..
B 206	June 25	7:00 a.m.	23.0	.....	.....		..
B 207	June 25	4:00 p.m.	24.0	.....	.....	...	..
B 208	June 27	7:00 a.m.	23.0	.....	.....	..	..
B 209	June 27	4:00 p.m.	23.8	.....	.....	.	....
B 210	June 28	7:00 a.m.	23.0	.....	.....	....	....
B 211	June 28	4:00 p.m.	24.0	.....	.....	.. ...	.....
B 212	June 29	7:00 a.m.	22.7	.....	.....	..	..
B 213	June 29	4:00 p.m.	23.8	.....	.....		.. ..
B 214	June 30	7:00 a.m.	22.9	.....	.....	.. ...	.. ..
B 215	June 30	4:00 p.m.	25.2	.....	.....	.. .	..
B 216	July 1	7:00 a.m.	22.9	.....	.....	.	.
B 217	July 1	4:00 p.m.	24.3	.....	.....	.. ...	.....
B 218	July 3	4:00 p.m.	24.5	.....	.....	.. ..	.. ..
B 219	July 4	7:00 a.m.	23.0	.....	.....	.. .	....
B 220	July 4	4:00 p.m.	23.5	.....	.....	.. ..	..
B 221	July 5	7:00 a.m.	23.5	.....	.....	.....	..
B 222	July 5	4:00 p.m.	24.5	.....	.....	.. ...	....
B 223	July 6	7:00 a.m.	23.0	.....	.....	.....	..
B 224	July 6	4:00 p.m.	24.6	.....	.....	.. ...	....
B 225	July 7	7:00 a.m.	23.5	.....	.....	....	..
B 226	July 7	4:00 p.m.	24.5	.....	.....	.. ..	.
B 227	July 8	7:00 a.m.	23.5	.....	.....	.. .	.. ...
B 228	July 8	4:00 p.m.	25.0	.....	.....	..	.
B 229	July 9	7:00 a.m.	22.3	.....	.....	.. ...	.....
B 230	July 9	4:00 p.m.	25.0	.....	.....	.. ...	.. ..
B 231	July 10	7:00 a.m.	23.5	.....	.....	.....	..
B 232	July 10	4:00 p.m.	25.0	.....	.....	.....	.....
B 233	July 11	7:00 a.m.	23.5	.....	.....	.....	.... ..

TABLE 2.—DATA RELATIVE TO SAN DIEGO BAY—(*Continued*)

Part A—Preliminary Observations

Surface Observations made from Glorietta Boat-house, 32° 40.7 N, 117° 10.5 W

Water sample number	Date	Time of day	Temperature in centigrade	Specific gravity $S\frac{0°}{4°0}$	Specific gravity $S\frac{17.5}{17.5}$	Specific gravity $S\frac{t°}{4°0}$	Salinity S ‰
	1904						
B 234	July 11	4:00 p.m.	25.0	.....	.....	.....	.....
B 235	July 12	7:00 a.m.	23.5	.....	.....	.....	.....
B 236	July 12	4:00 p.m.	25.0	.....	.....	.....	.....
B 237	July 13	7:00 a.m.	23.6	.....	.....	.....	.....
B 238	July 13	4:00 p.m.	25.5	.....	.....	.....	.....
B 239	July 14	7:00 a.m.	23.0	.....	.....	.....	.....
B 240	July 14	4:00 p.m.	24.0	.....	.....	.....	.....
B 241	July 15	7:00 a.m.	23.0	.....	.....	.....	.....
B 242	July 17	7:00 a.m.	23.0	.....	.....	.....	.....
B 243	July 17	4:00 p.m.	24.0	.....	.....	.....	.....
B 244	July 18	7:00 a.m.	23.0	.....	.....	.....	.....
B 245	July 18	4:00 p.m.	24.0	.....	.....	.....	.....
B 246	July 19	7:00 a.m.	23.0	.....	.....	.....	.....
B 247	July 19	4:00 p.m.	23.5	.....	.....	.....	.....
B 248	July 20	7:00 a.m.	23.5	.....	.....	.....	.....
B 249	July 20	4:00 p.m.	24.0	.....	.....	.....	.....
B 250	July 21	7:00 a.m.	23.2	.....	.....	.....	.....
B 251	July 21	4:00 p.m.	24.8	.....	.....	.....	.....
B 252	July 22	7:00 a.m.	24.0	.....	.....	.....	.....
B 253	July 22	4:00 p.m.	25.0	.....	.....	.....	.....
B 254	July 23	7:00 a.m.	24.5	.....	.....	.....	.....
B 255	July 23	4:00 p.m.	25.2	.....	.....	.....	.....
B 256	July 24	7:00 a.m.	24.5	.....	.....	.....	.....
B 257	July 24	4:00 p.m.	25.2	.....	.....	.....	.....
B 258	July 25	7:00 a.m.	25.0	.....	.....	.....	.....
B 259	July 25	4:00 p.m.	25.8	.....	.....	.....	.....
B 260	July 26	7:00 a.m.	25.0	.....	.....	.....	.....
B 261	July 26	4:00 p.m.	25.8	.....	.....	.....	.....
B 262	July 27	7:00 a.m.	25.0	.....	.....	.....	.....
B 263	July 27	4:00 p.m.	25.8	.....	.....	.....	.....
B 264	July 28	7:00 a.m.	25.0	.....	.....	.....	.....
B 265	July 29	7:00 a.m.	25.0	.....	.....	.....	.....
B 266	July 29	4:00 p.m.	26.0	.....	.....	.....	.....

Surface Observations made from National City Pier, 32° 40.0 N, 117° 7.0 W

	1903						
B 267	July 2	4:00 p.m.	23.3	291	277	248	36.2
B 268	July 3	5:00 p.m.	24.2	293	279	247	36.5
B 269	July 4	8:00 a.m.	23.9	289	275	244	36.0
B 270	July 4	6:45 p.m.	24.5	294	280	247	36.6
B 271	July 5	4:45 p.m.	25.0	293	279	245	36.5
B 272	July 7	2:30 p.m.	25.5	296	282	246	36.8
B 273	July 8	9:30 a.m.	24.5	295	281	248	36.7
B 274	July 8	10:00 a.m.	24.0	293	279	247	36.5
B 275	July 9	10:15 a.m.	24.5	291	277	244	36.2
B 276	July 12	11:35 a.m.	25.0	289	275	241	36.0
B 277	July 16	1:00 p.m.	25.5	293	279	243	36.5
B 278	July 18	9:45 a.m.	25.0	295	281	246	36.7
B 279	July 19	6:00 p.m.	26.0	294	280	242	36.6
B 280	July 22	9:30 a.m.	25.0	293	279	245	36.5

Surface Observations made in mid-channel near the Coronado Ferry Slip, 32° 42.7 N, 117° 10.3 W

	1903						
B 281	Dec. 21	12:30 p.m.	14.8	269	256	249	33.5
B 282	Dec. 22	9:25 a.m.	14.5	270	257	250	33.6
B 283	Dec. 22	12:01 p.m.	15.0	270	257	249	33.6
B 284	Dec. 23	10:10 a.m.	14.6	271	258	251	33.7
B 285	Dec. 23	12:01 p.m.	14.8	268	255	248	33.3

Table 2.—Data Relative to San Diego Bay—(*Continued*)

Part A—Preliminary Observations

Surface Observations made in mid-channel near the Coronado Ferry Slip, 32° 42.17 N, 117° 10.33 W

Water sample number	Date	Time of day	Temperature in centigrade	Specific gravity $S\frac{0°}{4°0}$	Specific gravity $S\frac{17°5}{17°5}$	Specific gravity $S\frac{t°}{4°0}$	Salinity S ‰
B 286	Dec. 25	3:30 p.m.	14°1	270	257	251	33.6
B 287	Dec. 26	3:50 p.m.	14.6	271	258	251	33.7
B 288	Dec. 28	12:01 p.m.	13.7	272	259	254	33.8
B 289	Dec. 29	11:00 a.m.	13.5	273	259	255	34.0
B 290	Dec. 29	12:15 p.m.	13.6	273	259	255	34.0
B 291	Dec. 31	1:45 p.m.	13.1	.....	.....	.....	.....
B 292	Dec. 31	3:40 p.m.	13.6	272	259	254	33.8

Surface Observations made from the Coronado Ferry Slip, 32° 41.9 N, 117° 10.3 W

	1904						
B 293	June 21	4:25 p.m.	19°9	.....	.....	.....	.....
B 294	June 22	10:30 a.m.	21.0	.....	.....	.....	.....
B 295	June 23	6:00 p.m.	19.4	.....	.....	.....	.....
B 296	June 24	12:01 p.m.	22.2	.....	.....	.....	.....
B 297	June 27	2:15 p.m.	21.2	.....	.....	.....	.....
B 298	June 29	3:15 p.m.	22.0	.....	.....	.....	.....
B 299	June 30	11:40 a.m.	20.4	.....	.....	.....	.....
B 300	July 1	4:50 p.m.	22.0	.....	.....	.....	.....
B 301	July 2	4:30 p.m.	22.0	.....	.....	.....	.....
B 302	July 3	4:40 p.m.	21.0	.....	.....	.....	.....
B 303	July 5	4:30 p.m.	22.2	.....	.....	.....	.....
B 304	July 6	4:30 p.m.	22.0	.....	.....	.....	.....
B 305	July 7	4:30 p.m.	22.0	.....	.....	.....	.....
B 306	July 8	4:30 p.m.	23.0	.....	.....	.....	.....
B 307	July 9	4:30 p.m.	23.0	.....	.....	.....	.....
B 308	July 10	4:30 p.m.	22.8	.....	.....	.....	.....
B 309	July 11	4:30 p.m.	22.5	.....	.....	.....	.....
B 310	July 12	4:30 p.m.	22.0	.....	.....	.....	.....
B 311	July 13	4:30 p.m.	21.5	.....	.....	.....	.....
B 312	July 14	4:30 p.m.	20.0	.....	.....	.....	.....
B 313	July 17	4:30 p.m.	21.0	.....	.....	.....	.....
B 314	July 19	4:30 p.m.	22.0	.....	.....	.....	.....
B 315	July 21	4:30 p.m.	22.0	.....	.....	.....	.....
B 316	July 23	4:30 p.m.	23.0	.....	.....	.....	.....
B 317	July 25	4:30 p.m.	22.8	.....	.....	.....	.....
B 318	July 27	4:30 p.m.	23.0	.....	.....	.....	.....

EXPLANATION OF TABLE 2, PART B

On August 30, 1912, a series of temperature and salinity observations was commenced for the purpose of determining the relation between the seasonal variation in San Diego Bay and in the ocean. The bay observations were, for the most part, made in Glorietta Bight where the influence of the ocean is least, and the ocean observations were made from Coronado Pier which, while being only about half a mile west of Glorietta Bight, is scarcely, if at all, contaminated by bay water because of a jetty which, being located at the mouth of the bay about three miles west of Coronado Pier, directs the outgoing tides to the south. In addition, bay samples taken for other special purposes are tabulated in this part.

First column.—Water sample numbers entered with respect first to location, second to time.

Second column.—Date.

Third column.—Time when the sample was collected entered to the nearest minute.

Fourth column.—Tide; falling, rising, high, and low tides being indicated by the letters F, R, H, and L.

Fifth column.—Depth entered to the nearest 0.1 meter.

Sixth column.—Temperature *in situ*.

Seventh, eighth, and ninth columns.—Specific gravity of sample under atmospheric pressure, the 1.0 being omitted; for meaning of symbols see page 48.

Tenth column.—Salinity *per mille* determined from pycnometer measurements (see p. 28).

Table 2.—Data Relative to San Diego Bay—(*Continued*)

Part B—Special Bay Data

Water sample number	Date	Time of day	Tide	Depth in meters	Temperature in centigrade	Specific gravity $S\frac{0°}{4°0}$	$S\frac{17°5}{17°5}$	$S\frac{t°}{4°0}$	Salinity S ‰
	1912								
B 319	Sept. 7	11:45 a.m.	F	0	19°2	2714	2580	2406	33.77
B 320	Sept. 14	2:45 p.m.	F	0	18.6	2715	2581	2422	33.78
B 321	Sept. 21	8:00 a.m.	F	0	19.2	2719	2585	2411	33.83
B 322	Oct. 5	2:45 p.m.	R	0	17.2	2710	2671	2451	33.72
B 323	Oct. 12	9:45 a.m.	H	0	18.0	2723	2589	2444	33.89
B 324*	Oct. 15	7:55 a.m.	....	0	17.5	2713	2579	2447	33.76
B 325*	Oct. 15	8:00 a.m.	....	0.2	17.6	2720	2586	2452	33.85
B 326*	Oct. 15	8:05 a.m.	....	0	17.5	2710	2576	2444	33.72
B 327	Oct. 19	11:00 a.m.	F	0	17.8	2704	2571	2431	33.65
B 328*	Oct. 20	8:20 a.m.	....	0.2	18.2	2711	2577	2428	33.74
B 329*	Oct. 20	8:30 a.m.	....	0	18.1	2720	2586	2440	33.85
B 330*	Oct. 20	8:40 a.m.	....	0	18.2	2714	2580	2431	33.77
B 331	Oct. 27	11:50 a.m.	....	0	17.6	2715	2581	2447	33.78
B 332	Nov. 3	1:15 p.m.	F	0	15.2	2688	2555	2477	33.45
B 333	Nov. 11	2:00 p.m.	F	0	16.4	2711	2577	2471	33.73
B 334	Nov. 18	12:10 p.m.	H	0	14.8	2706	2573	2502	33.68
B 335	Nov. 24	11:15 a.m.	F	0	14.9	2690	2557	2481	33.47
B 336	Dec. 8	11:30 a.m.	F	0	13.8	2703	2570	2520	33.64
B 337	Dec. 15	11:00 a.m.	H	0	13.4	2695	2562	2520	33.54
B 338	Dec. 22	11:30 a.m.	F	0	12.6	2687	2554	2529	33.44
B 339	Dec. 29	12:30 p.m.	H	0	12.2	2691	2558	2541	33.49

* Supplementary observations made at La Jolla (32° 51′2 N, 117° 17′5 W) to compare the effects of desert winds blowing from Oct. 12 to Oct. 16.

Observations made in Glorietta Bight, 32° 40′6 N, 117° 10′0 W

	1912								
B 340	Aug. 30	1:45 p.m.	H	0	23°2	2830	2691	2407	35.22
B 341	Sept. 7	11:25 a.m.	F	0	21.2	2829	2690	2462	35.20
B 342	Sept. 14	2:30 p.m.	F	0	22.6	2800	2662	2460	34.84
B 343	Sept. 21	7:45 a.m.	....	0	23.2	2806	2668	2385	34.92
B 344	Oct. 5	2:30 p.m.	R	0	19.0	2792	2654	2485	34.74
B 345†	Oct. 12	9:25 a.m.	H	0	18.6	2794	2656	2497	34.77
B 346†	Oct. 19	10:50 a.m.	F	0	19.8	2809	2670	2481	34.96
B 347†	Oct. 27	12:05 p.m.	....	0	19.0	2803	2665	2496	34.88
B 348	Nov. 3	1:30 p.m.	F	0	16.0	2800	2662	2565	34.84
B 349	Nov. 11	2:20 p.m.	F	0	17.2	2730	2595	2470	33.97
B 350	Nov. 18	12:30 p.m.	....	0	14.7	2799	2661	2593	34.84
B 351	Nov. 24	11:30 a.m.	....	0	15.2	2787	2649	2577	34.68
B 352‡	Dec. 2	12:01 p.m.	H	0	14.8	2728	2593	2522	33.95
B 353	Dec. 8	12:01 p.m.	F	0	13.7	2733	2598	2551	34.01
B 354	Dec. 15	11:20 a.m.	H	0	13.2	2755	2619	2582	34.28
B 355	Dec. 22	11:45 a.m.	F	0	12.4	.....	.....	.....	.....
B 356	Dec. 29	12:45 p.m.	H	0	11.2	2752	2616	2617	34.24

† Compare with water samples B 323 to B 331.

‡ Taken at Coronado Ferry Slip (32° 41′9 N, 117° 10′3 W).

Observations made off National City Pier, 32° 40′0 N, 117° 7′0 W

	1908								
B 357	July 14	1:15 p.m.	R	0	27°9	2928	2785	2359	36.44
B 358	July 14	2:15 p.m.	R	0	27.4	2934	2791	2378	36.52
B 359	July 14	3:15 p.m.	R	0	26.9	2902	2759	2363	36.12
B 360	July 14	4:15 p.m.	R	0	26.4	2924	2781	2400	36.40
B 361	July 14	5:45 p.m.	H	0	25.2	2891	2748	2404	35.97

Observations made to Determine Tidal Effects, 32° 43′1 N, 117° 11′4 W

	1911								
B 362	May 7	11:45 a.m.	L	0	17°5	2755	2619	2485	34.28
B 363	May 7	6:25 p.m.	H	0	17.7	2761	2625	2488	34.36
B 364	May 8	12:25 p.m.	L	0	17.5	2739	2604	2472	34.09

TABLE 2.—DATA RELATIVE TO SAN DIEGO BAY—(*Continued*)

Part B—Special Bay Data

Observations made to Determine Tidal Effects, 32° 43′1 N, 117° 11′4 W

Water sample number	Date	Time of day	Tide	Depth in meters	Temperature in centigrade	Specific gravity $S\frac{0°}{4°0}$	$S\frac{17°5}{17°5}$	$S\frac{t°}{4°0}$	Salinity $S^{0}/_{00}$
	1911								
B 365	May 8	6:50 p.m.	H	0	17°8	2765	2629	2490	34.41
B 366	May 9	1:10 p.m.	L	0	17.4	2740	2605	2474	34.10
B 367	May 9	7:20 p.m.	H	0	17.2	2742	2607	2483	34.12
B 368	May 10	1:40 p.m.	L	0	17.6	2754	2618	2484	34.27
B 369	May 10	7:45 p.m.	H	0	18.5	2750	2614	2457	34.22
B 370	May 11	8:40 a.m.	H	0	18.1	2756	2620	2473	34.30
B 371	May 11	2:05 p.m.	L	0	17.4	2724	2589	2459	33.90
B 372	May 12	9:20 a.m.	H	0	17.5	2743	2608	2475	34.14
B 373	May 12	2:25 p.m.	L	0	18.9	2756	2620	2453	34.30
B 374	May 13	10:00 a.m.	H	0	18.4	2749	2613	2459	34.21
B 375	May 13	2:45 p.m.	L	0	17.8	2766	2630	2489	34.42
B 376	May 14	10:40 a.m.	H	0	17.8	2777	2641	2502	34.57
B 377	May 14	3:00 p.m.	L	0	17.6	2758	2622	2487	34.32
B 378	May 15	6:00 a.m.	L	0	18.1	2754	2618	2471	34.27
B 379	May 15	1:00 p.m.	H	0	18.0	2759	2623	2479	34.34
B 380	May 16	6:00 a.m.	L	0	18.5	2758	2622	2465	34.32
B 381	May 16	2:00 p.m.	H	0	18.2	2776	2639	2490	34.55
B 382	May 17	6:30 a.m.	L	0	18.6	2762	2626	2466	34.37
B 383	May 17	3:00 p.m.	H	0	18.9	2779	2642	2475	34.58
B 384	May 18	7:00 a.m.	L	0	19.2	2759	2623	2448	34.34
B 385	May 18	4:00 p.m.	H	0	18.6	2783	2646	2476	34.63
B 386	May 19	7:30 a.m.	L	0	19.6	2778	2641	2456	34.57
B 387	May 19	4:30 p.m.	H	0	19.1	2767	2631	2459	34.43
B 388	May 20	8:40 a.m.	L	0	19.9	2783	2645	2453	34.63
B 389	May 20	4:40 p.m.	H	0	19.2	2773	2636	2461	34.51
B 390	May 21	9:40 a.m.	L	0	18.9	2793	2655	2488	34.76
B 391	May 21	5:00 p.m.	H	0	19.7	2765	2629	2440	34.41
B 392	May 22	10:30 a.m.	L	0	19.8	2768	2631	2440	34.45
B 393	May 22	5:25 p.m.	H	0	19.6	2745	2610	2424	34.16
B 394	May 23	11:30 a.m.	L	0	20.0	2761	2625	2430	34.36
B 395	May 23	6:00 p.m.	H	0	19.4	2768	2631	2451	34.45
B 396	May 24	12:10 p.m.	L	0	19.8	2754	2618	2426	34.27
B 397	May 24	6:30 p.m.	H	0	18.9	2752	2616	2449	34.25
B 398	May 25	1:00 p.m.	L	0	.....	2758	2622	.....	34.32
B 399	May 25	7:00 p.m.	H	0	18.9	2752	2616	2449	34.25
B 400	May 26	1:30 p.m.	L	0	18.7	2755	2619	2458	34.29
B 401	May 26	7:40 p.m.	H	0	18.2	2741	2606	2456	34.11

Observations made in the Mouth of False Bay, 32° 45′3 N, 117° 15′0 W

	1910								
B 402	July 20	2:00 p.m.	....	0.2	28°8	2728	2593	2142	33.95
B 403	July 20	2:05 p.m.	....	0.5	26.8	2719	2585	2198	33.84
B 404	July 20	2:10 p.m.	....	0.5	29.1	2745	2610	2150	34.16
B 405	July 20	2:15 p.m.	....	0.7	29.4	2802	2664	2194	34.88
B 406	July 20	2:20 p.m.	....	0.3	31.4	2749	2613	2084	34.21
B 407	July 20	2:25 p.m.	....	1.0	26.4	2727	2592	2216	33.94
B 408	July 20	2:30 p.m.	....	0.4	25.2	2720	2586	2243	33.85
B 409	July 20	2:35 p.m.	....	0.7	27.0	2724	2589	2196	33.90
B 410	July 20	2:40 p.m.	....	0.7	26.4	2719	2585	2209	33.84
B 411	July 20	2:45 p.m.	....	0.7	25.9	2725	2590	2226	33.91
B 412	July 20	2:50 p.m.	....	0.3	22.3	2714	2580	2323	33.78
B 413*	July 20	3:55 p.m.	....	0	29.0	2853	2712	2256	35.51
B 414*	July 20	4:00 p.m.	....	0	29.0	2856	2715	2257	35.55

* Taken at the east end of False Bay (32° 47′5 N, 117° 12′5 W).

EXPLANATION OF TABLE 2, PART C

This part includes all the miscellaneous observations made in San Diego Bay which have only an indirect bearing upon the special investigations tabulated in parts A and B, or upon the ocean work.

First column.—Water sample numbers entered in chronological order irrespective of location.

Second column.—Time when the sample was collected entered to the nearest minute.

Third and fourth columns.—Latitude and longitude entered to the nearest 0.01.

Fifth column.—Depth from which the sample was taken entered to the nearest meter.

Sixth column.—Temperature *in situ.*

Seventh, eighth, and ninth columns.—Specific gravity of sample under atmospheric pressure, the 1.0 being omitted; for meaning of symbols see page 48.

Tenth column.—Salinity *per mille* determined from pycnometer measurements (see p. 28) unless followed by the letter *c*, in which case Mohr's titrimetric method was used (see p. 32).

TABLE 2.—DATA RELATIVE TO SAN DIEGO BAY—(*Continued*)

Part C—Miscellaneous Bay Data

Water sample number	Time of day	Position		Depth in meters	Temperature in centigrade	Specific gravity			Salinity S ‰
		North latitude	West longitude			0° S / 4°0	17°5 S / 17°5	1° S / 4°0	
			July 18, 1908						
B 415	8:30 a.m.	32° 42'60	117° 10'90	0	20°8	2789	2651	2434	34.71
B 416	9:00 a.m.	32 42.17	117 10.33	0	20.0	2737	2602	2407	34.06
B 417	10:30 a.m.	32 40.77	117 10.50	0	24.3	.....	.....	.....	.....
B 418	12:45 p.m.	32 42.60	117 10.90	0	18.0	2735	2600	2456	34.04
			July 17, 1909						
B 419	8:05 a.m.	32 42.60	117 10.70	0	20.8	2759	2623	2406	34.33
B 420	8:12 a.m.	32 42.45	117 10.50	0	21.5	2771	2632	2399	34.49
B 421	8:22 a.m.	32 42.40	117 10.35	0	21.4	2780	2643	2410	34.60
B 422	8:32 a.m.	32 42.17	117 10.33	0	20.8	2757	2621	2403	34.31
B 423	8:42 a.m.	32 41.85	117 10.15	0	22.3	2800	2662	2405	34.85
B 424	10:10 a.m.	32 40.77	117 10.50	0	23.6	2869	2727	2436	35.70
B 425	12:10 p.m.	32 40.60	117 10.00	0	24.3	2847	2706	2391	35.43
			July 21, 1909						
B 426*	8:54 a.m.	32 47.28	117 15.00	0	24.6	2804	2666	2345	34.90
B 427	9:15 a.m.	32 46.97	117 14.68	0	24.4	2808	2669	2351	34.95
B 428	9:50 a.m.	32 46.62	117 14.34	0	24.8	2803	2665	2335	34.89
B 429	10:16 a.m.	32 46.63	117 14.00	0	24.0	2786	2648	2342	34.68
B 430	10:50 a.m.	32 47.28	117 13.98	0	24.4	2809	2670	2351	34.96
B 431	11:22 a.m.	32 47.02	117 13.74	0	23.5	2770	2633	2342	34.47
B 432	11:37 a.m.	32 46.60	117 13.36	0	22.2	2743	2608	2354	34.14
B 433	12:35 p.m.	32 46.46	117 13.14	0	28.8	2855	2745	2261	35.53
B 434	12:50 p.m.	32 46.50	117 13.56	0	25.6	2776	2639	2283	34.55
B 435	1:13 p.m.	32 46.56	117 13.78	0	20.4	2719	2585	2380	33.84
B 436	3:10 p.m.	32 47.28	117 15.00	0	25.6	2805	2667	2310	34.91
* Water samples B 426 to B 436 taken in False Bay.									
			July 9, 1910						
B 437	9:15 a.m.	32 42.46	117 10.48	0	20.6	2774	2637	2426	34.52 c
B 438	9:25 a.m.	32 42.35	117 10.32	0	20.6	2765	2629	2417	34.41
B 439	9:30 a.m.	32 42.19	117 10.10	0	20.4	2778	2641	2424	34.57
B 440	9:36 a.m.	32 42.09	117 10.13	0	20.0	2760	2624	2428	34.35
B 441	9:42 a.m.	32 41.98	117 10.19	0	19.8	2742	2607	2417	34.12 c
B 442	9:50 a.m.	32 41.92	117 10.26	0	20.2	2776	2639	2439	34.55 c
B 443	10:02 a.m.	32 41.90	117 10.04	0	19.6	2763	2627	2441	34.39
B 444	10:12 a.m.	32 41.70	117 9.94	0	20.6	2794	2656	2445	34.77
B 445	10:16 a.m.	32 41.45	117 9.90	0	22.6	2795	2682	2391	34.79 c
B 446	10:23 a.m.	32 41.00	117 9.88	0	22.5	2822	2683	2419	35.12 c
B 447	10:50 a.m.	32 40.56	117 10.00	0	23.3	2846	2706	2418	35.42
B 448	2:45 p.m.	32 40.77	117 10.50	0	25.2	2868	2728	2381	35.69
B 449	3:00 p.m.	32 40.53	117 10.00	0	24.6	2852	2712	2385	35.50 c
B 450	3:15 p.m.	32 41.08	117 9.84	0	22.4	.....	.....	.....	.....
B 451	3:35 p.m.	32 41.73	117 9.90	0	21.1	2794	2656	2431	34.77
B 452	3:50 p.m.	32 41.97	117 9.94	0	20.6	2753	2617	2407	34.26 c
B 453	4:20 p.m.	32 42.46	117 10.48	0	20.9	2776	2639	2421	34.55
			July 16, 1910						
B 454	7:17 p.m.	32 42.08	117 13.82	0	18.3	2737	2602	2451	34.06
B 455	7:25 p.m.	32 42.53	117 13.30	0	15.4	2716	2582	2498	33.80
B 456	7:30 p.m.	32 42.77	117 12.78	0	15.5	2720	2586	2500	33.85
B 457	7:35 p.m.	32 42.83	117 12.32	0	15.8	.....	.....	.....	.....
B 458	7:40 p.m.	32 42.78	117 11.70	0	19.6	2753	2617	2432	34.26
			April 27, 1912						
B 459	9:00 a.m.	32 39.30	117 13.95	7	14.15	2712	2578	2522	33.75
B 460	9:00 a.m.	32 39.30	117 13.95	0	14.1	2705	2572	2516	33.66
B 461	9:15 a.m.	32 40.30	117 13.80	7	14.4	2709	2575	2513	33.71
B 462	9:15 a.m.	32 40.30	117 13.80	0	14.5	2710	2576	2512	33.73
B 463	9:30 a.m.	32 41.10	117 13.90	7	14.55	2779	2642	2577	34.58
B 464	9:30 a.m.	32 41.10	117 13.90	0	14.8	2741	2606	2535	34.11
B 465	9:45 a.m.	32 42.00	117 14.10	7	15.35	2722	2588	2504	33.88
B 466	9:45 a.m.	32 42.00	117 14.10	0	15.3	2713	2579	2498	33.76
B 467	9:55 a.m.	32 42.60	117 13.55	7	15.25	2716	2582	2502	33.80
B 468	9:55 a.m.	32 42.60	117 13.55	0	15.7	2716	2582	2493	33.80
B 469	10:05 a.m.	32 42.95	117 12.90	7	15.85	2726	2591	2497	33.93
B 470	10:05 a.m.	32 42.95	117 12.90	0	15.9	2722	2588	2492	33.88

Table 2.—Data Relative to San Diego Bay—(*Concluded*)

Part C—Miscellaneous Bay Data

Water sample number	Time of day	Position		Depth in meters	Temperature in centigrade	Specific gravity			Salinity $S^{0}/_{00}$
		North latitude	West longitude			$S\frac{0°}{4°0}$	$S\frac{17°5}{17°5}$	$S\frac{t°}{4°0}$	
				April 27, 1912					
B 471	10:20 a.m.	32° 42.95	117° 11.75	7	16.95	2721	2587	2467	33.86
B 472	10:20 a.m.	32 42.95	117 11.75	0	16.9	2721	2587	2468	33.86
B 473	10:30 a.m.	32 42.40	117 10.60	7	17.3	2735	2600	2473	34.04
B 474	10:30 a.m.	32 42.40	117 10.60	0	17.4	2729	2594	2464	33.96
B 475	10:40 a.m.	32 42.00	117 10.00	7	17.05	2752	2616	2494	34.25
B 476	10:40 a.m.	32 42.00	117 10.00	0	17.5	2733	2598	2466	34.01
B 477	10:55 a.m.	32 41.60	117 8.90	7	17.05	2740	2605	2484	34.10
B 478	10:55 a.m.	32 41.60	117 8.90	0	17.7	2738	2603	2466	34.07
B 479	11:00 a.m.	32 40.90	117 8.30	7	16.55	2777	2640	2530	34.56
B 480	11:00 a.m.	32 40.90	117 8.30	0	18.2	2730	2595	2446	33.97
B 481	11:15 a.m.	32 40.25	117 7.50	7	17.55	2779	2642	2507	34.58
B 482	11:15 a.m.	32 40.25	117 7.50	0	18.5	2730	2595	2439	33.97
B 483	11:35 a.m.	32 39.90	117 7.40	3	17.55	2764	2628	2494	34.40
B 484	11:35 a.m.	32 39.90	117 7.40	0	18.6	2754	2618	2458	34.27
B 485	11:50 a.m.	32 39.20	117 7.30	6	18.55	2744	2609	2451	34.15
B 486	11:50 a.m.	32 39.20	117 7.30	0	18.7	2735	2600	2439	34.04
				August 4, 1912					
B 487	7:00 p.m.	32 42.4	117 10.6	0	21.4	.....	.....	.....	.....
B 488	8:00 p.m.	32 42.4	117 10.6	0	21.9	2766	2630	2383	34.42
B 489	9:00 p.m.	32 42.4	117 10.6	0	21.6	.....	.....	.....	.....
B 490	10:10 p.m.	32 42.4	117 10.6	0	20.7	.....	.....	.....	.....
B 491	11:05 p.m.	32 42.4	117 10.6	0	20.8	.....	.....	.....	.....
				August 5, 1912					
B 492	12:01 a.m.	32 42.4	117 10.6	0	20.9	2733	2598	2379	34.01
B 493	1:00 a.m.	32 42.4	117 10.6	0	21.4	.....	.....	.....	.....
B 494	3:05 a.m.	32 42.4	117 10.6	0	20.8	.....	.....	.....	.....
B 495	5:05 a.m.	32 42.4	117 10.6	0	20.4	2763	2627	2421	34.39
B 496	7:10 a.m.	32 42.4	117 10.6	0	20.7	.....	.....	.....	.....

EXPLANATION OF TABLE 3

In the fall of 1908 a Fox apparatus (see Fox, 1905) for determining the gaseous content of sea water was procured and, in 1911, Mr. H. C. Burbridge succeeded in measuring the carbon dioxide, nitrogen, and oxygen dissolved in a selected series of samples. However, considerable difficulty was experienced mainly because of the absence of a supply of gas for fuel, and, as it is almost necessary both for operating and repairing the apparatus, the systematic analysis of gas content was not undertaken. While the few results obtained are tabulated, as usual, to the nearest 0.01 c.c., the condition under which the analyses were made was so unsatisfactory that the error is probably greater than this would indicate.

First column.—Water sample numbers entered in chronological order; for information relative to date, time, latitude, longitude, temperature *in situ*, specific gravity, and salinity refer to the same water sample numbers entered in Table 1.

Second column.—Depth from which the sample was collected entered to the nearest meter.

Third column.—Amount of carbon di-oxide per kilogram of the sample measured in cubic centimeters at 0° C. under 760 millimeters pressure.

Fourth column.—Amount of nitrogen per kilogram of the sample measured as stated above.

Fifth column.—Amount of oxygen per kilogram of the sample measured as stated above.

TABLE 3.—GAS CONTENT

Water-sample number	Depth in meters	CO_2 c.c. per kg.	N c.c. per kg.	O c.c. per kg.
1898	18	32.63	6.91	2.66
1899	6	28.51	6.86	2.52
1901	82	39.28	10.29	2.22
1903	11	34.85	8.38	3.18
1904	37	38.70	12.99	3.98
1905	16	29.86	6.03	3.17
1906	9	33.80	8.65	3.21
1908	137	45.54	12.05	1.55
1909	92	36.47	9.11	1.73
1910	13	35.10	8.42	3.88
1912	110	37.30	8.43	1.60
1913	73	38.92	10.02	1.45
1914	27	38.31	9.63	3.72
1915	82	41.81	10.96	2.41
1916	55	36.34	10.16	2.35
1917	7	28.71	8.78	3.00
2016	137	41.03	10.36	1.73
2017	92	41.66	12.59	1.60
2018	13	41.32	12.35	4.43
2019	110	35.98	9.40	1.48
2020	73	37.93	9.29	2.03
2023	55	34.02	9.57	1.61
2024	7	35.93	7.97	3.23
2027	46	38.50	8.91	3.17
2029	6	36.07	8.64	3.71
2031	64	38.23	8.75	2.30
2032	18	38.13	10.23	4.17
2033	37	38.43	9.46	3.60
2034	16	33.12	7.07	2.57
2035	9	33.67	10.38	3.06

EXPLANATION OF TABLE 4

All the soundings entered in this table were made with the Thompson sounding machine (see p. 9) unless otherwise stated in the table. Only those are given whose error is *known* to be within two per cent of the depth.

First column.—Number of sounding entered in chronological order.

Second column.—Date.

Third column.—Time when the lead struck bottom entered to the nearest minute; this enables comparison with collections made at nearly the same time (see Appendix III).

Fourth column.—Section; for explanation see page 46.

Fifth and sixth columns.—Latitude and longitude; for error see pages 18 and 45.

Seventh column.—Depth of bottom entered to the nearest meter above 300 and to the nearest five below that depth.

Eighth column.—Character of bottom denoted by the abbreviations adopted by the United States Coast and Geodetic Survey; they are explained in Appendix IV.

TABLE 4.—SOUNDINGS

Number of sounding	Date	Time of day	Section	Position		Depth in meters	Character of bottom
				N. latitude	W. longitude		
	1905						
1	June 27	.....	40_{11}	32° 54?8	117° 20?3	385	
2	June 28	5:30 a.m.	40_{10}	32 53.8	117 19.2	185	
3	June 28	2:55 p.m.	40_{11}	32 53.6	117 18.4	146	
4	June 29	5:50 a.m.	40_{11}	32 54.2	117 21.0	185	
5	June 29	7:07 a.m.	40_{11}	32 53.3	117 19.7	92	
6	June 30	4:55 a.m.	40_{11}	32 53.4	117 18.8	185	
7	July 1	6:00 a.m.	40_{11}	32 53.6	117 18.0	200	
8	July 1	6:55 a.m.	(39_{11})	32 52.8	117 17.3	110	
9	July 5	1:05 p.m.	41_{11}	32 57.1	117 25.9	510	
10	July 8	6:00 a.m.	40_{11}	32 52.7	117 18.0	185	
11	July 11	11:40 a.m.	$(40)_{10}$	32 52.3	117 17.7	200	
	1906						
12	June 26	10:15 a.m.	41_{11}	32 55.7	117 23.7	565	
13	July 3	9:30 a.m.	$(40)_{10}$	32 51.0	117 20.0	73	rky.
14	July 3	3:00 p.m.	(39_{10})	32 51.5	117 16.4	145	rky.
15	July 11	10:35 a.m.	40.5_{11}	32 56.8	117 22.5	680	
16	July 11	12:50 p.m.	40.5_{11}	32 56.8	117 22.5	630	
17	July 18	11:10 a.m.	41_{11}	32 53.0	117 25.6	620	
18	July 19	11:25 a.m.	41_{10}	32 49.6	117 26.9	600	
19	July 20	9:30 a.m.	$(40)_{10}$	32 51.2	117 18.8	80	M. R.
20	July 21	10:30 a.m.	41_{11}	32 54.6	117 25.2	600	
21	July 23	9:25 a.m.	40_{11}	32 54.3	117 21.4	420	
	1908						
22	June 9	2:15 p.m.	40_{11}	32 53.3	117 18.0	247	
23	June 10	8:54 a.m.	(40_{12})	32 57.8	117 20.0	390	gn. M.
24	June 10	9:26 a.m.	40_{11}	32 57.4	117 21.8	510	
25	June 10	9:52 a.m.	41_{11}	32 55.4	117 24.5	695	fne. gy. S. bk. Sp.
26	June 10	10:25 a.m.	41_{10}	32 54.3	117 27.4	640	gn. M.
27	June 10	10:56 a.m.	42_{11}	32 53.1	117 29.5	720	gn. M.
28	June 10	11:29 a.m.	42_{10}	32 51.6	117 32.0	840	gn. M. yl. Sp.
29	June 10	12:08 p.m.	43_{10}	32 50.3	117 34.5	955	
30	June 10	1:04 p.m.	44_{9}	32 47.0	117 40.0	1080	gn. br. M.
31	June 10	1:51 p.m.	44_{9}	32 43.6	117 38.0	1180	gn. M.
32	June 10	3:06 p.m.	43_{9}	32 44.7	117 34.5	1045	gn. M.
33	June 10	4:13 p.m.	$41_{9.5}$	32 47.5	117 26.2	510	gn. M. yl. Sp.
34	June 11	9:41 a.m.	(40_{13})	33 2.8	117 19.5	40	S.
35	June 11	10:03 a.m.	(40_{12})	33 1.7	117 22.0	385	gn. M. S.
36	June 11	10:19 a.m.	(40.5_{12})	33 2.3	117 22.5	415	gn. M.
37	June 11	10:47 a.m.	(40_{12})	33 1.4	117 22.3	400	gn. M.
38	June 11	11:05 a.m.	41_{11}	33 3.2	117 23.9	380	
39	June 11	11:57 a.m.	42_{12}	32 59.8	117 28.0	725	gn. M.
40	June 11	12:26 p.m.	42_{12}	32 57.9	117 30.6	785	gn. M.
41	June 11	1:33 p.m.	43_{10}	32 56.0	117 33.5	850	gn. M.
42	June 11	3:00 p.m.	42_{11}	32 55.3	117 31.7	815	gn. M.
43	June 11	3:37 p.m.	42_{11}	32 54.5	117 29.5	685	gn. M.
44	June 12	7:15 a.m.	41_{10}	32 42.3	117 24.9	625	gn. M.
45	June 12	7:44 a.m.	41_{10}	32 52.6	117 26.6	720	gn. M. yl. Sp.
46	June 12	8:16 a.m.	42_{11}	32 53.0	117 29.6	840	
47	June 12	8:50 a.m.	42_{11}	32 54.1	117 31.7	905	gn. M.
48	June 12	9:26 a.m.	43_{10}	32 53.2	117 33.1	970	gn. M.
49	June 13	6:42 a.m.	(40_{12})	33 0.2	117 20.0	205	C. S.
50	June 14	6:57 a.m.	(40_{12})	33 1.0	117 20.0	180	bk. M.
51	June 14	9:15 a.m.	(41_{11})	33 9.6	117 26.7	345	gn. M.
52	June 15	7:56 a.m.	40_{8}	32 38.3	117 20.2	100	bk. S.
53	June 15	8:19 a.m.	41_{8}	32 38.5	117 23.0	240	gn. M.
54	June 15	8:45 a.m.	41_{8}	32 39.0	117 26.0	400	bu. M.
55	June 15	9:08 a.m.	42_{8}	32 39.3	117 27.8	275	yl. S.
56	June 15	9:55 a.m.	42_{8}	32 39.6	117 30.0	905	gn. M.
57	June 15	12:12 p.m.	42_{7}	32 37.3	117 29.8	1255	gn. M.
58	June 15	1:25 p.m.	42_{8}	32 38.2	117 31.3	1210	gn. M.
59	June 15	1:59 p.m.	43_{8}	32 39.6	117 33.0	1215	gn. M.
60	June 15	3:10 p.m.	42_{8}	32 41.5	117 28.0	415	rky.
61	June 16	8:20 a.m.	42_{10}	32 48.8	117 32.1	950	gn. M.
62	June 16	9:50 a.m.	43_{10}	32 48.5	117 34.4	990	gn. M.
63	June 16	10:45 a.m.	42_{9}	32 47.0	117 31.8	960	gy. M. S. yl. Sp.

Table 4.—Soundings—(*Continued*)

Number of sounding	Date 1908	Time of day	Section	Position N. latitude	Position W. longitude	Depth in meters	Character of bottom
64	June 16	12:40 p.m.	42_9	32° 46.9	117° 31.8	925	gn. M.
65	June 16	1:50 p.m.	41_9	32 44.0	117 27.0	530	gn. M.
66	June 16	2:45 p.m.	40_9	32 47.2	117 22.3	86	gn. M.
67	June 18	9:00 a.m.	44_{10}	32 51.7	117 40.2	1035	gn. M.
68	June 18	9:55 a.m.	45_{10}	32 52.0	117 45.9	1115	gn. M.
69	June 18	10:45 a.m.	45_{10}	32 51.4	117 46.0	1070	gn. M.
70	June 18	12:05 p.m.	46_{10}	32 50.8	117 51.9	1100	gn. M.
71	June 18	12:50 p.m.	46_{10}	32 50.5	117 49.3	1100	gn. M.
72	June 18	1:40 p.m.	45_{10}	32 49.8	117 46.0	1025	gn. M.
73	June 18	3:10 p.m.	44_{10}	32 48.9	117 40.2	925	gn. M.
74	June 19	7:05 a.m.	40_{11}	32 55.1	117 20.5	325	dk. gn. M.
75	June 19	7:38 a.m.	41_{11}	32 57.3	117 23.2	550	gn. M.
76	June 19	8:47 a.m.	(40.5_{12})	32 58.5	117 22.5	605	gn. M. yl. Sp.
77	June 19	2:45 p.m.	40_{13}	32 55.8	117 18.5	46	S.
78	June 19	4:05 p.m.	40_{13}	32 53.5	117 19.6	405	S.
79	June 23	1:55 p.m.	41_8	32 40.4	117 26.3	330	
80	June 23	2:11 p.m.	41_8	32 40.7	117 27.2	485	bk. S.
81	June 23	2:41 p.m.	42_8	32 40.9	117 29.5	1025	
82	June 23	3:11 p.m.	42_8	32 41.2	117 29.6	1155	gn. M.
83	June 23	3:37 p.m.	42_8	32 41.4	117 30.3	1155	gn. M.
84	June 24	9:18 a.m.	42_{13}	33 4.7	117 29.4	610	gn. M.
85	June 24	11:05 a.m.	42_{13}	33 5.5	117 31.6	730	
86	June 24	12:10 p.m.	42_{13}	33 5.1	117 30.6	755	gn. M.
87	June 25	9:03 a.m.	40_{14}	32 55.0	117 21.5	570	
88	June 25	2:00 p.m.	$(40)_{10}$	32 48.8	117 20.7	88	bk. S.
89	June 26	7:04 a.m.	42_8	32 40.6	117 31.5	735	gn. M.
90	June 26	7:35 a.m.	43_8	32 40.6	117 33.0	1020	gn. M.
91	June 26	7:58 a.m.	43_8	32 40.6	117 33.9	1190	gn. M.
92	June 26	8:25 a.m.	43_8	32 40.6	117 34.7	1175	gn. M.
93	June 26	8:50 a.m.	43_8	32 40.4	117 35.3	1175	gn. M.
94	June 26	9:13 a.m.	43_8	32 39.8	117 34.9	1205	gn. M.
95	June 26	9:37 a.m.	43_8	32 39.6	117 34.7	1100	
96	June 26	10:03 a.m.	43_8	32 39.3	117 35.3	1150	gn. M.
97	June 26	10:28 a.m.	43_8	32 39.3	117 36.0	1185	
98	June 26	10:57 a.m.	43_8	32 39.3	117 37.0	1195	gn. M.
99	June 26	11:23 a.m.	43_8	32 38.7	117 37.3	1215	gn. M.
100	June 27	5:35 a.m.	40_{14}	32 54.4	117 21.5	585	bk. S.
101	June 29	7:22 a.m.	42_8	32 38.7	117 28.5	195	bk. S.
102	June 29	7:36 a.m.	42_8	32 39.4	117 28.9	195	bk. S.
103	June 29	7:46 a.m.	42_8	32 40.2	117 29.4	330	bk. S.
104	June 29	8:04 a.m.	42_8	32 41.2	117 29.7	525	rky.
105	June 29	8:20 a.m.	42_8	32 42.0	117 29.8	600	gn. M.
106	June 29	8:38 a.m.	42_8	32 42.8	117 30.0	765	gn. M.
107	June 29	8:58 a.m.	42_9	32 43.5	117 30.0	815	gn. M.
108	June 29	9:20 a.m.	42_9	32 44.0	117 30.0	895	gn. M.
109	June 29	9:42 a.m.	42_9	32 44.4	117 30.0	970	gn. M.
110	June 29	10:09 a.m.	42_9	32 45.2	117 30.0	1100	gn. M.
111	June 29	10:40 a.m.	42_9	32 45.7	117 30.0	1140	gn. M.
112	June 29	11:00 a.m.	42_9	32 46.2	117 30.0	1150	gn. M.
113	June 29	12:31 p.m.	43_8	32 40.4	117 35.1	1280	gn. M. bk. S.
114	June 29	12:58 p.m.	43_8	32 40.2	117 35.1	1260	gn. M.
115	June 29	1:20 p.m.	43_8	32 40.0	117 35.1	1260	gn. M.
116	June 29	1:50 p.m.	43_8	32 39.3	117 35.6	1280	gn. M.
117	June 29	2:10 p.m.	43_8	32 39.2	117 35.7	1290	gn. M.
118	June 29	2:48 p.m.	43_8	32 38.7	117 36.2	1305	gn. M.
119	June 29	3:16 p.m.	43_8	32 38.3	117 36.5	1310	gn. M.
120	June 29	3:45 p.m.	43_8	32 37.7	117 36.6	1320	gn. M.
121	June 29	4:10 p.m.	43_7	32 37.3	117 36.6	1335	gn. M.
122	June 29	4:37 p.m.	43_7	32 36.8	117 36.6	1335	gn. M.
123	June 30	8:45 a.m.	40_{14}	32 54.4	117 21.2	585	bk. S.
124	June 30	2:27 p.m.	40_{14}	32 54.3	117 21.7	570	bk. S.
125	June 30	2:55 p.m.	40_{14}	32 54.4	117 21.5	505	gn. M. bk. S.
126	July 1	9:37 a.m.	49_{14}	33 10.0	118 3.0	995	gn. M.
127	July 1	10:30 a.m.	50_{14}	33 11.2	118 7.8	900	gn. M.
128	July 1	12:01 p.m.	50_{14}	33 11.0	118 9.8	680	bk. S.

TABLE 4.—SOUNDINGS—(*Continued*)

Number of sounding	Date 1908	Time of day	Section	Position N. latitude	Position W. longitude	Depth in meters	Character of bottom
129	July 1	12:35 p.m.	50_{14}	33° 11.3	118° 8.1	715	bk. S.
130	July 1	1:50 p.m.	50_{14}	33 12.4	118 10.8	1145	gn. M.
131	July 2	7:25 a.m.	50_{13}	33 6.5	118 9.7	1135	gn. br. M.
132	July 2	10:40 a.m.	51_{12}	32 58.0	118 15.0	1170	gn. br. M.
133	July 2	3:30 p.m.	45_{13}	33 5.0	117 44.3	740	gn. M.
134	July 6	3:40 p.m.	49_{1}	32 48.8	118 5.9	870	gy. M.
135	July 7	6:45 a.m.	52_{4}	32 46.4	118 20.6	505	bk. M.
136	July 7	8:13 a.m.	52_{5}	32 46.6	118 21.5	275	bk. S.
137	July 7	10:35 a.m.	52_{7}	32 45.6	118 20.5	330	bk. S.
138	July 7	11:30 a.m.	52_{8}	32 45.8	118 19.6	795	gy. S.
139	July 8	6:30 a.m.	52_{6}	32 47.0	118 18.7	1005	br. M.
140	July 8	7:20 a.m.	52_{9}	32 47.9	118 19.8	970	rky.
141	July 8	9:00 a.m.	52_{10}	32 48.4	118 20.2	1100	bk. S.
142	July 9	9:15 a.m.	54_{12}	33 2.0	118 32.3	146	R. Sh.
143	July 9	10:10 a.m.	54_{12}	32 58.3	118 30.0	550	gy. M.
144	July 9	1:36 p.m.	54_{12}	33 0.2	118 30.9	1080	gn. M.
145	July 10	6:43 a.m.	50_{13}	32 53.4	118 10.2	975	gn. yl. M.
146	July 11	7:05 a.m.	61_{4}	32 21.9	119 6.8	230	bk. S.
147	July 11	8:08 a.m.	62_{1}	32 22.0	119 7.8	110	rky.
148	July 11	8:18 a.m.	62_{4}	32 22.1	119 8.3	110	S.
149	July 11	8:33 a.m.	62_{4}	32 22.3	119 7.4	106	brk. R.
150	July 11	8:49 a.m.	62_{5}	32 23.2	119 8.1	92	bk. S.
151	July 11	9:10 a.m.	62_{5}	32 24.2	119 8.9	73	bk. S.
152	July 16	9:30 a.m.	51_{10}	32 48.2	118 13.5	880	gn. M. bk. S.
153	July 17	8:10 a.m.	61_{5}	Soundings 153 to		88	crs. S.
154	July 17	10:36 a.m.	61_{5}	207 were made		82	crs. S.
155	July 17	10:48 a.m.	61_{5}	on Cortez Banks		97	crs. S.
156	July 17	11:14 a.m.	61_{5}	within 2'5 from		146	crs. S.
157	July 17	11:33 a.m.	61_{5}	32° 25′ N and		92	crs. S. brk. Sh.
158	July 17	2:38 p.m.	61_{5}	119° 3′ W. It		92	bk. M.
159	July 17	2:48 p.m.	61_{5}	was impossible		95	bk. M.
160	July 17	2:55 p.m.	61_{5}	to obtain more		99	crs. bk. S.
161	July 17	3:06 p.m.	61_{5}	exact positions.		101	C. brk. S.
162	July 17	3:18 p.m.	61_{5}			161	fne. wh. S.
163	July 17	3:32 p.m.	61_{5}			99	rky.
164	July 17	3:48 p.m.	61_{5}			101	rky.
165	July 17	4:00 p.m.	61_{5}			82	rky.
166	July 17	4:16 p.m.	61_{5}			35	rky.
167	July 17	4:28 p.m.	61_{5}			42	rky.
168	July 17	5:35 p.m.	61_{5}			40	rky.
169	July 18	7:22 a.m.	61_{5}			31	rky.
170	July 18	7:34 a.m.	61_{5}	Soundings 170 to		15	rky.
171	July 18	7:45 a.m.	61_{5}	207 were made		13	rky.
172	July 18	7:50 a.m.	61_{5}	with a hand line		13	rky.
173	July 18	7:52 a.m.	61_{5}	from a row boat.		13	rky.
174	July 18	7:55 a.m.	61_{5}			11	rky.
175	July 18	7:57 a.m.	61_{5}			13	rky.
176	July 18	7:58 a.m.	61_{5}			15	rky.
177	July 18	8:00 a.m.	61_{5}			15	rky.
178	July 18	8:03 a.m.	61_{5}			15	rky.
179	July 18	8:10 a.m.	61_{5}			11	rky.
180	July 18	8:12 a.m.	61_{5}			13	rky.
181	July 18	8:14 a.m.	61_{5}			12	rky.
182	July 18	8:16 a.m.	61_{5}			11	rky.
183	July 18	8:22 a.m.	61_{5}			16	rky.
184	July 18	8:27 a.m.	61_{5}			16	rky.
185	July 18	8:30 a.m.	61_{5}			15	rky.
186	July 18	8:32 a.m.	61_{5}			13	rky.
187	July 18	8:33 a.m.	61_{5}			11	rky.
188	July 18	8:35 a.m.	61_{5}			11	rky.
189	July 18	8:36 a.m.	61_{5}			7	rky.
190	July 18	8:37 a.m.	61_{5}			7	rky.
191	July 18	8:38 a.m.	61_{5}			7	rky.
192	July 18	8:39 a.m.	61_{5}			7	rky.
193	July 18	8:40 a.m.	61_{5}			6	rky.

Table 4.—Soundings—(*Continued*)

Number of sounding	Date	Time of day	Section	Position		Depth in meters	Character of bottom
				N. latitude	W. longitude		
	1908						
194	July 18	8:41 a.m.	61_5			4.5	Bishop's Rock
195	July 18	8:42 a.m.	61_5			6	rky.
196	July 18	8:44 a.m.	61_5			11	rky.
197	July 18	8:45 a.m.	61_5			10	rky.
198	July 18	8:50 a.m.	61_5			9	rky.
199	July 18	8:52 a.m.	61_5			7	rky.
200	July 18	8:55 a.m.	61_5			7	rky.
201	July 18	8:58 a.m.	61_5			11	rky.
202	July 18	8:59 a.m.	61_5			7	rky.
203	July 18	9:00 a.m.	61_5			7	rky.
204	July 18	9:01 a.m.	61_5			8	rky.
205	July 18	9:02 a.m.	61_5			8	rky.
206	July 18	9:35 a.m.	61_5			22	rky.
207	July 18	9:36 a.m.	61_5			20	rky.
208	July 21	9:55 a.m.	41_{11}	32° 56.9	117° 25.8	570	gn. M.
209	July 21	10:31 a.m.	41_{11}	32 53.0	117 26.8	660	gn. M.
210	July 21	10:58 a.m.	42_{10}	32 49.6	117 28.8	790	gn. M.
211	July 22	7:35 a.m.	43_{10}	32 49.2	117 34.3	800	gn. M.
212	Aug. 29	8:00 a.m.	51^{35}	29 7.0	118 17.0	730	bk. S.
213	Aug. 29	8:25 a.m.	51^{33}	29 7.1	118 17.0	1610	bk. gy. S.
	1909						
214	Feb. 19	6:35 a.m.	44_5	32 41.5	117 39.7	1135	
215	June 15	11:25 a.m.	42_{10}	32 52.4	117 32.9	760	gn. M.
216	June 16	2:50 p.m.	41_{10}	32 52.0	117 32.1	760	gn. M.
217	June 22	4:20 a.m.	42_{11}	32 53.1	117 36.4	1015	gn. M.
218	June 24	3:55 a.m.	42_{10}	32 52.0	117 30.0	640	gn. M.
219	July 1	10:05 a.m.	$52_{10.5}$	32 52.5	118 21.5	970	bk. S.
220	July 2	1:00 p.m.	42_5	32 41.2	117 32.3	1115	gn. M.
221	July 2	4:25 p.m.	41_8	32 40.0	117 26.0	265	gn. M. yl. Sp.
222	Aug. 31	12:52 p.m.	53_{12}	33 1.0	118 24.5	630	bk. S. R.
223	Sept. 1	7:09 a.m.	54_{10}	32 50.5	118 32.0	115	ers. bk. S.
224	Sept. 1	7:55 a.m.	55_{11}	32 52.1	118 35.5	475	ers. S. gn. M.
225	Sept. 1	8:22 a.m.	55_{10}	32 51.2	118 35.5	475	
226	Sept. 1	10:34 a.m.	56_{12}	33 0.0	118 41.3	650	gn. M. S. R.
227	Sept. 2	9:50 a.m.	59.5_5	32 23.3	118 57.5	258	gn. M.
228	Sept. 2	10:09 a.m.	60_5	32 22.6	118 58.5	320	
229	Sept. 2	11:15 a.m.	61_4	32 18.7	119 3.0	790	gn. M.
230	Sept. 2	11:34 a.m.	61_4	32 20.6	119 3.8	485	
231	Sept. 2	11:55 a.m.	60_4	32 21.7	119 2.3	155	gn. M. S.
232	Sept. 2	12:07 p.m.	60_4	32 22.0	119 0.9	240	gn. M. S.
233	Sept. 2	12:20 p.m.	60_5	32 24.0	119 1.7	92	
234	Sept. 2	12:32 p.m.	60_5	32 26.0	119 2.3	77	
235	Sept. 2	1:05 p.m.	60_5	32 27.3	119 2.3	92	
236	Sept. 2	1:20 p.m.	61_5	32 28.0	119 3.0	420	
237	Sept. 3	8:12 a.m.	49_{11}	32 49.4	118 3.8	845	gn. M.
238	Sept. 3	9:00 a.m.	48_{10}	32 49.8	118 1.9	730	gn. M.
239	Sept. 3	9:14 a.m.	48_{10}	32 50.1	118 1.5	730	
240	Nov. 2	6:00 a.m.	42_{10}	32 52.0	117 30.0	685	gn. M.
241	Nov. 2	12:01 p.m.	41_{10}	32 52.0	117 26.0	100	
242	Nov. 2	12:35 p.m.	$41_{10.5}$	32 52.5	117 25.1	73	
243	Nov. 2	12:48 p.m.	41_{11}	32 53.2	117 24.0	128	
244	Nov. 2	12:57 p.m.	41_{11}	32 53.7	117 22.6	442	
245	Nov. 2	1:12 p.m.	40.5_{11}	32 53.8	117 22.5	365	gn. M.
246	Nov. 4	11:20 a.m.	42_5	32 40.4	117 30.6	1260	gn. M.
247	Nov. 4	11:52 a.m.	42_5	32 40.6	117 30.3	1190	gn. M.
248	Nov. 5	8:40 a.m.	42_5	32 40.5	117 29.0	825	gn. M.
249	Nov. 5	9:02 a.m.	42_5	32 40.6	117 30.3	1190	gn. M.
250	Mar. 16	1:20 p.m.	42_5	32 39.7	117 27.7	550	
251	Apr. 20	4:33 a.m.	40_4	32 22.4	117 19.0	365	gn. M.
252	Aug. 13	11:03 a.m.	40_4	32 23.4	117 18.2	158	gn. M.
253	Aug. 13	4:20 p.m.	40_4	32 23.4	117 21.9	820	gn. M.
254	Aug. 14	3:00 p.m.	41_4	32 23.4	117 24.2	1150	gn. M.
255	Aug. 15	1:18 p.m.	40_{11}	32 52.8	117 19.0	300	
	1910						
256	Aug. 16	10:10 a.m.	41_4	32 23.4	117 24.2	1134	gn. M.
257	Aug. 16	1:47 p.m.	41_4	32 23.4	117 24.2	1134	gn. M.

TABLE 4.—SOUNDINGS—(*Continued*)

Number of sounding	Date	Time of day	Section	Position		Depth in meters	Character of bottom
				N. latitude	W. longitude		
	1910						
258	Aug. 17	10:44 a.m.	40_5	32° 23.4	117° 18.2	110	gn. M.
259	Aug. 17	11:10 a.m.	40_5	32 23.4	117 18.2	260	gn. M.
260	Aug. 18	7:40 a.m.	39_5	32 23.3	117 14.5	27	
261	Aug. 18	7:55 a.m.	39_5	32 23.3	117 15.2	55	
262	Aug. 18	8:53 a.m.	40_5	32 23.4	117 17.8	147	
263	Aug. 18	9:25 a.m.	40_5	32 23.4	117 20.0	370	
264	Aug. 18	9:45 a.m.	40_5	32 24.5	117 20.0	370	
265	Aug. 18	10:05 a.m.	40_5	32 24.4	117 17.6	73	
266	Aug. 18	10:27 a.m.	39_5	32 24.3	117 15.3	37	
267	Aug. 18	10:55 a.m.	39_5	32 25.0	117 16.3	92	
268	Aug. 18	12:40 p.m.	39_7	32 35.1	117 14.8	46	
	1911						
269	June 12	11:45 a.m.	39_5	32 22.9	117 15.8	55	S.
270	June 12	11:59 a.m.	39_5	32 22.8	117 16.0	70	S.
271	June 12	12:25 p.m.	39_5	32 22.6	117 16.2	73	S.
272	June 12	1:00 p.m.	39_5	32 22.7	117 16.7	77	S.
273	June 12	1:06 p.m.	39_4	32 22.3	117 17.0	82	S.
274	June 12	1:18 p.m.	39_4	32 22.2	117 17.2	101	S.
275	June 12	1:30 p.m.	39_4	32 22.0	117 17.4	119	S.
276	June 12	1:45 p.m.	40_4	32 21.9	117 17.6	128	S.
277	June 12	1:55 p.m.	40_4	32 21.8	117 17.9	174	S.
278	June 12	2:10 p.m.	40_4	32 21.7	117 18.1	300	S. G.
279	June 12	2:28 p.m.	40_4	32 21.5	117 18.4	395	gn. M. S.
280	June 12	2:45 p.m.	40_4	32 21.4	117 18.6	630	gn. M. S.
281	June 12	3:05 p.m.	40_4	32 21.2	117 18.8	840	gn. M.
282	June 12	3:27 p.m.	40_4	32 21.2	117 19.1	1090	gn. M.
283	June 12	4:00 p.m.	40_4	32 21.0	117 19.3	1135	gn. M.
284	June 20	8:55 a.m.	39_5	32 23.6	117 17.1	110	gn. M.
285	June 21	4:40 a.m.	40_4	32 22.4	117 21.2	1280	gn. M.
286	June 21	7:55 a.m.	40_4	32 22.4	117 21.2	1290	gn. M. S.
287	June 21	8:20 a.m.	40_4	32 22.4	117 21.2	1290	gn. M.
288	June 21	8:55 a.m.	40_5	32 22.7	117 20.7	1240	gn. M.
289	June 27	6:00 a.m.	39_5	32 23.2	117 14.7	49	
290	June 27	6:30 a.m.	39_5	32 22.9	117 15.2	57	
291	June 27	7:10 a.m.	39_5	32 22.6	117 15.6	71	
292	June 27	7:35 a.m.	39_4	32 22.2	117 16.1	75	
293	June 27	8:45 a.m.	39_4	32 21.6	117 17.0	110	
294	June 27	9:40 a.m.	40_4	32 20.9	117 18.1	275	
295	June 27	10:20 a.m.	40_4	32 20.2	117 19.0	945	gn. M.
296	June 27	1:52 p.m.	40_4	32 18.3	117 21.8	1190	gn. M.
297	June 27	2:45 p.m.	41_4	32 19.7	117 22.8	1390	gn. M.
298	June 27	3:50 p.m.	40_4	32 21.0	117 21.1	1390	gn. M.
299	June 27	4:40 p.m.	40_4	32 21.6	117 20.2	1320	gn. M.
300	June 27	5:00 p.m.	$40_{4.5}$	32 22.5	117 19.2	840	gn. M.
301	June 28	5:55 a.m.	39_5	32 24.7	117 15.6	37	
302	June 28	6:25 a.m.	39_5	32 24.2	117 16.4	99	
303	June 28	6:55 a.m.	39_5	32 23.8	117 16.7	110	
304	June 28	7:30 a.m.	39.5_5	32 23.6	117 17.5	154	
305	June 28	8:00 a.m.	40_5	32 23.0	117 18.5	520	gn. M.
306	June 28	8:55 a.m.	40_5	32 26.5	117 18.5	66	
307	June 28	9:15 a.m.	40_5	32 26.1	117 19.0	97	
308	June 28	9:45 a.m.	40_5	32 25.7	117 19.5	240	
309	June 28	10:15 a.m.	40_5	32 25.3	117 20.0	665	
310	June 28	10:40 a.m.	40_5	32 24.7	117 20.8	1115	gn. M.
311	June 28	11:15 a.m.	40_5	32 24.2	117 21.8	1270	
312	June 29	7:00 a.m.	41_5	32 26.6	117 25.6	1440	gn. M.
313	June 29	9:30 a.m.	40_7	32 33.2	117 19.4	195	
314	June 29	10:10 a.m.	40_7	32 34.1	117 18.6	205	
315	June 29	10:40 a.m.	40_7	32 34.8	117 17.8	106	
316	June 29	11:15 a.m.	39_7	32 36.7	117 16.1	59	
317	June 29	11:50 a.m.	39_7	32 37.4	117 14.6	35	
318	Aug. 10	10:10 a.m.	41_4	32 18.2	117 24.7	1480	gn. M.
319	Aug. 11	5:30 a.m.	40_4	32 20.9	117 21.1	1410	gn. M.
320	Aug. 11	10:42 a.m.	40_5	32 22.7	117 19.2	540	gn. M.
321	Aug. 11	12:46 p.m.	39_5	32 23.5	117 17.4	110	gn. M.

Table 4.—Soundings—(*Concluded*)

Number of sounding	Date	Time of day	Section	Position		Depth in meters	Character of bottom
				N. latitude	W. longitude		
	1911						
322	Aug. 11	1:58 p.m.	39_5	32° 23.9	117° 17.0	93	
323	Aug. 11	2:37 p.m.	39_5	32 24.2	117 16.5	77	
324	Aug. 12	4:40 a.m.	39_5	32 24.2	117 15.0	33	
325	Aug. 12	5:12 a.m.	39_5	32 24.6	117 15.8	26	
326	Aug. 12	6:50 a.m.	40_6	32 31.4	117 21.5	380	
327	Aug. 12	8:35 a.m.	40_7	32 32.6	117 20.2	124	
328	Aug. 12	9:20 a.m.	40_6	32 31.9	117 20.5	610	
329	Aug. 12	10:45 a.m.	40_7	32 33.6	117 18.0	117	
330	Aug. 12	11:26 a.m.	39_7	32 34.0	117 16.9	97	
331	Aug. 12	12:30 p.m.	39_7	32 37.3	117 16.0	48	
332	Aug. 12	12:56 p.m.	39_7	32 37.1	117 14.9	33	
	1912						
333	Feb. 10	8:25 a.m.	$(38)_6$	32 28.0	117 11.2	31	rky.
334	Mar. 23	7:45 a.m.	40_5	32 24.0	117 18.0	108	gn. M.
335	Apr. 26	6:00 a.m.	40_5	32 23.5	117 18.0	137	gn. M.
336	July 16	6:20 a.m.	(39_5)	32 43.4	117 16.8	37	
337	July 16	6:25 a.m.	(39_5)	32 43.5	117 17.1	51	
338	July 16	6:30 a.m.	(39_5)	32 43.5	117 17.4	55	
339	July 16	6:36 a.m.	40_5	32 43.6	117 17.7	57	
340	July 16	6:42 a.m.	40_5	32 43.7	117 18.0	57	
341	July 16	6:50 a.m.	40_5	32 43.7	117 18.3	68	
342	July 16	6:55 a.m.	40_5	32 43.8	117 18.6	71	
343	July 16	7:00 a.m.	40_5	32 43.9	117 18.9	73	
344	July 16	7:10 a.m.	40_5	32 43.9	117 19.2	79	
345	July 16	7:15 a.m.	40_5	32 44.0	117 19.5	81	
346	July 16	7:22 a.m.	40_5	32 44.1	117 19.8	85	
347	July 16	7:30 a.m.	40_5	32 44.1	117 20.0	85	
348	July 16	7:35 a.m.	40_5	32 44.2	117 20.2	86	
349	July 16	7:45 a.m.	40_5	32 44.3	117 20.7	95	
350	July 16	7:50 a.m.	40_5	32 44.3	117 20.9	97	
351	July 16	7:55 a.m.	40_5	32 44.4	117 21.2	99	
352	July 16	8:05 a.m.	40_5	32 44.5	117 21.6	99	
353	July 16	8:20 a.m.	41_5	32 44.8	117 23.3	245	
354	July 16	8:36 a.m.	41_6	32 45.1	117 24.4	400	
355	July 16	8:47 a.m.	41_6	32 45.5	117 25.5	485	
356	July 16	9:13 a.m.	41_6	32 45.7	117 26.8	570	
357	July 16	9:38 a.m.	42_6	32 46.0	117 28.5	770	
358	July 16	10:03 a.m.	42_6	32 46.2	117 29.7	785	
359	July 16	10:54 a.m.	42_5	32 46.5	117 30.9	780	
360	July 16	11:26 a.m.	43_5	32 47.0	117 33.0	860	
361	July 16	12:05 p.m.	$43_{4.5}$	32 47.5	117 35.2	955	
362	July 17	7:45 a.m.	(39_5)	32 43.5	117 17.1	46	
363	July 17	8:40 a.m.	40_5	32 43.7	117 18.3	68	
364	July 17	9:14 a.m.	40_5	32 44.1	117 20.0	85	
365	July 17	10:10 a.m.	40_5	32 44.5	117 21.6	99	
366	July 17	10:40 a.m.	41_5	32 45.0	117 24.0	340	
367	July 17	11:59 a.m.	41_5	32 46.2	117 22.4	123	
368	July 22	6:10 a.m.	(39_5)	32 43.2	117 16.7	22	
369	July 22	6:30 a.m.	(39_5)	32 43.0	117 16.0	11	
370	July 22	7:30 a.m.	(39_5)	32 43.5	117 17.1	46	
371	July 22	8:30 a.m.	40_5	32 43.7	117 18.3	68	
372	July 22	9:00 a.m.	40_5	32 44.1	117 20.0	79	
373	July 22	9:30 a.m.	40_5	32 44.5	117 21.6	106	
374	July 22	10:20 a.m.	41_5	32 45.0	117 24.1	375	
375	July 22	11:15 a.m.	41_4	32 45.5	117 26.4	530	
376	Aug. 3	10:20 a.m.	40_4	32 22.0	117 19.2	550	gn. M.

C. Biological Field Data

EXPLANATION OF TABLE 5, PART A

This part includes all the field data relative to the plankton collected prior to July 12, 1908, the collections being mainly of a preliminary nature.

First column.—Numbers under which the collections were accessioned; they are arranged, as a rule, according to date from May 16, 1904, to May 20, 1905, then from May 22, 1901, to January 5, 1904, then from June 19, 1905, to July 29, 1907, then from June 11 to June 12, 1908, and finally from November 2 to November 3, 1907.

Second column.—Apparatus used in making the hauls: 000, 8, 12, and 20 refer to tow-nets (see p. 9) of the mesh indicated having the dimensions given in Appendix I. K.B. refers to the Kofoid water bottle (see p. 11). P.F., P.12, P.20, and P.D. refer to the sub-surface pump (see p. 11), the F indicating that the water was filtered through filter paper, the 12 through No. 12 netting, and the 20 through No. 20 netting, while the D indicates that after settling the water was decanted.

Third column.—Date.

Fourth column.—Time and duration of haul entered to the nearest five minutes, which is as close as it was ever originally recorded.

Fifth column.—Section; for explanation see page 46.

Sixth and seventh columns.—Latitude and longitude entered usually to the nearest 0.1; the position is probably not accurate to more than 0.5 miles.

Eighth column.— Depth at beginning and end of haul entered to the nearest meter above and to the nearest five below 100 meters; the error is probably greater than this would indicate.

Ninth column.—Miscellaneous remarks relative to hauls.

Table 5.—Data Relative to Plankton Hauls

Part A—Preliminary Plankton Collections

Haul number	Apparatus used	Date 1904	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Remarks
1	000	May 16	6:00 a.m.	41_7	32° 35.8	117° 23.8	210–0	
2	20	May 16	6:00 a.m.	41_7	32 35.8	117 23.8	120–0	
3	20	May 16	6:00 a.m.	41_7	32 35.8	117 23.8	165–0	
4	20	May 16	.....	41_7	32 35.8	117 23.8	120–0	Hauls 4–5 made
5	20	May 16	.....	41_7	32 35.8	117 23.8	165–0	between 6:00
6	000	May 18	6:00 a.m.	41_8	32 39.6	117 26.0	165–0	and 9:00 a.m.
7	20	May 18	6:00 a.m.	41_8	32 39.6	117 26.0	92–0	
8	20	May 18	6:00 a.m.	41_8	32 39.6	117 26.0	120–0	
9	20	May 18	.....	41_8	32 39.6	117 26.0	130–0	Hauls 9–11 made
10	20	May 18	.....	41_8	32 39.6	117 26.0	165–0	between 6:00
11	000	May 18	.....	41_8	32 39.6	117 26.0	210–0	and 9:00 a.m.
12	000	May 20	6:00 a.m.	40_7	32 33.2	117 22.1	200–0	
13	000	May 20	.....	40_7	32 33.2	117 22.1	230–0	Hauls 13, 16, and
14	20	May 20	6:00 a.m.	40_7	32 33.2	117 22.1	110–0	17 made between
15	20	May 20	6:00 a.m.	40_7	32 33.2	117 22.1	135–0	6:00 and 9:00
16	20	May 20	.....	40_7	32 33.2	117 22.1	155–0	a.m.
17	20	May 20	.....	40_7	32 33.2	117 22.1	185–0	
18	000	May 24	6:00 a.m.	41_7	32 35.7	117 25.0	185–0	
19	000	May 24	.....	41_7	32 35.7	117 25.0	200–0	Hauls 19, 20, and
20	000	May 24	.....	41_7	32 35.7	117 25.0	220–0	23–26 made be-
21	20	May 24	6:00 a.m.	41_7	32 35.7	117 25.0	110–0	tween 6:00 and
22	20	May 24	6:00 a.m.	41_7	32 35.7	117 25.0	130–0	9:00 a.m.
23	20	May 24	.....	41_7	32 35.7	117 25.0	135–0	
24	20	May 24	.....	41_7	32 35.7	117 25.0	165–0	
25	20	May 24	.....	41_7	32 35.7	117 25.0	145–0	
26	20	May 24	.....	41_7	32 35.7	117 25.0	185–0	
27	000	May 26	6:00 a.m.	40_8	32 37.7	117 21.3	210–0	
28	20	May 26	6:00 a.m.	40_8	32 37.7	117 21.3	175–0	
29	20	May 26	6:00 a.m.	40_8	32 37.7	117 21.3	135–0	
30	000	May 26	.....	40_8	32 37.7	117 21.3	210–0	Hauls 30–32 made
31	20	May 26	.....	40_8	32 37.7	117 21.2	175–0	between 6:00
32	20	May 26	.....	40_8	32 37.7	117 21.3	135–0	and 9:00 a.m.
33	20	May 28	6:00 a.m.	41_8	32 42.3	117 26.1	100–0	
34	20	May 28	6:00 a.m.	41_8	32 42.3	117 26.1	135–0	
35	000	May 28	6:00 a.m.	41_8	32 42.3	117 26.1	175–0	
36	000	May 28	.....	41_8	32 42.3	117 26.1	210–0	Hauls 36–38 made
37	20	May 28	.....	41_8	32 42.3	117 26.1	135–0	between 6:00
38	20	May 28	.....	41_8	32 42.3	117 26.1	175–0	and 9:00 a.m.
39	000	May 28	.....	41_8	32 42.3	117 26.1	0	25 min. tow, prob-
41	20	May 31	6:00 a.m.	41_8	32 42.0	117 24.9	255–0	ably bet. 9:00
42	20	May 31	6:00 a.m.	41_8	32 42.0	117 24.9	220–0	and 10:00 a.m.
43	20	May 31	.....	41_8	32 42.0	117 24.9	290–0	Hauls 43–44, 46–
44	20	May 31	.....	41_8	32 42.0	117 24.9	340–0	48 made between
45	000	May 31	6:00 a.m.	41_8	32 42.0	117 24.9	385–0	6:00 and 9:00
46	000	May 31	.....	41_8	32 42.0	117 24.9	290–0	a.m.
47	000	May 31	.....	41_8	32 42.0	117 24.9	18	
48	20	May 31	.....	41_8	32 42.0	117 24.9	0	
50	000	June 2	6:00 a.m.	41_8	32 38.5	117 23.9	300–0	
51	20	June 2	6:00 a.m.	41_8	32 38.5	117 23.9	250–0	
52	20	June 2	6:00 a.m.	41_8	32 38.5	117 23.9	190–0	
53	000	June 2	.....	41_8	32 38.5	117 23.9	385–0	Hauls 53–56 made
54	20	June 2	.....	41_8	32 38.5	117 23.9	330–0	between 6:00
55	20	June 2	.....	41_8	32 38.5	117 23.9	275–0	and 9:00 a.m.
56	000	June 2	.....	41_8	32 38.5	117 23.9	46	20 minute tow
57	12	June 8	.....	40_8	32 38.8	117 21.6	155–0	Hauls 57–63 made
58	12	June 8	.....	40_8	32 38.8	117 21.6	245–0	between 6:00
59	000	June 8	.....	40_8	32 38.8	117 21.6	290–0	and 10:00 a.m.
60	20	June 8	.....	40_8	32 38.8	117 21.6	285–0	
61	20	June 8	.....	40_8	32 38.8	117 21.6	210–0	
62	20	June 8	.....	(39_8)	32 39.1	117 14.0	0	
63	000	June 8	.....	(39_8)	32 39.1	117 14.0	0	
64	000	June 9	.....	41_8	32 40.2	117 24.7	185–0	Hauls 64–71 made
65	12	June 9	.....	41_8	32 40.2	117 24.7	135–0	between 6:00
66	12	June 9	.....	41_8	32 40.2	117 24.7	0	and 9:00 a.m.

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part A—Preliminary Plankton Collections

Haul number	Apparatus used	Date 1904	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Remarks
67	12	June 9	.....	41_4	32° 40.2	117° 24.7	64–0	
68	20	June 9	.....	41_4	32 40.2	117 24.7	175–0	
69	20	June 9	.....	41_4	32 40.2	117 24.7	100–0	
70	000	June 9	.....	41_4	32 40.2	117 24.7	0	
71	20	June 9	.....	41_4	32 40.2	117 24.7	0	
72	12	June 10	10:00 a.m.	41_3	32 46.8	117 26.0	110–0	
73	20	June 10	10:00 a.m.	41_3	32 46.8	117 26.0	110–0	
74	20	June 10	10:00 a.m.	41_3	32 46.8	117 26.0	175–0	
75	12	June 10	.....	41_3	32 46.8	117 26.0	145–0	Hauls 75–79 made
75a	20	June 10	.....	41_3	32 46.8	117 26.0	145–0	between 10:00
76	000	June 10	.....	41_3	32 46.8	117 26.0	185–0	a.m. and noon
77	000	June 10	.....	41_3	32 46.8	117 26.0	0	20 minute tow
78	20	June 10	.....	41_3	32 46.8	117 26.0	0	15 minute tow
79	12	June 10	.....	41_3	32 46.8	117 26.0	0	15 minute tow
80	20	June 14	.....	41_1	32 43.3	117 26.3	165–0	Hauls 80–87 made
81	20	June 14	.....	41_1	32 43.3	117 26.3	100–0	between 6:00
82	12	June 14	.....	41_1	32 43.3	117 26.3	64 0	a.m. and noon
83	12	June 14	.....	41_1	32 43.3	117 26.3	135–0	
84	000	June 14	.....	41_1	32 43.3	117 26.3	175–0	
85	000	June 14	.....	41_1	32 43.3	117 26.3	0	20 minute tow
86	20	June 14	.....	41_1	32 43.3	117 26.3	0	15 minute tow
87	12	June 14	.....	41_1	32 43.3	117 26.3	0	15 minute tow
88	000	June 16	.....	40_2	32 31.6	117 18.6	82–0	Hauls 88–97a made
89	20	June 16	.....	40_2	32 31.6	117 18.6	100–0	between 6:00
90	12	June 16	.....	40_2	32 31.6	117 18.6	46–0	and 9:00 a.m.
91	20	June 16	.....	40_2	32 31.6	117 18.6	64–0	
92	12	June 16	.....	40_2	32 31.6	117 18.6	82–0	
93	20	June 16	.....	(39_2)	32 42.0	117 17.0	0	
94	12	June 16	.....	(39_2)	32 42.0	117 17.0	0	
95	000	June 16	.....	(39_2)	32 42.0	117 17.0	0	
96	20	June 16	.....	(39_2)	32 42.0	117 16.0	0	
97	000	June 16	.....	40_2	32 32.4	117 18.2	110–0	
*97a	12	June 16	10:00–? a.m.	B	32 40.7	117 10.2	0	
98	000	June 18	.....	$40_{2.5}$	32 32.5	117 18.6	190–0	Hauls 98–106 made
99	20	June 18	.....	$40_{2.5}$	32 32.5	117 18.6	185–0	between 6:00
100	12	June 18	.....	$40_{2.5}$	32 32.5	117 18.6	145–0	and 9:00 a.m.
101	20	June 18	.....	$40_{2.5}$	32 32.5	117 18.6	110–0	
102	20	June 18	.....	$40_{2.5}$	32 32.5	117 18.6	73–0	
103	000	June 18	.....	$40_{2.5}$	32 32.5	117 18.6	0	
104	12	June 18	.....	$40_{2.5}$	32 32.5	117 18.6	0	
105	20	June 18	.....	$40_{2.5}$	32 32.5	117 18.6	0	
106	20	June 18	.....	(39_2)	32 42.0	117 16.0	0	
107	000	June 21	.....	40_2	32 29.3	117 19.0	310 0	Hauls 107–114
108	20	June 21	.....	40_2	32 29.3	117 19.0	300–0	made between
109	12	June 21	.....	40_2	32 29.3	117 19.0	255–0	6:00 and 9:00
110	20	June 21	.....	40_2	32 29.3	117 19.0	210–0	a.m.
111	12	June 21	.....	40_2	32 29.3	117 19.0	165–0	
112	000	June 21	.....	40_2	32 29.3	117 19.0	18	
113	12	June 21	.....	40_2	32 29.3	117 19.0	4	
114	20	June 21	.....	40_2	32 29.3	117 19.0	0	
115	000	June 23	8:15–? a.m.	42_1	32 42.8	117 29.5	18	Hauls 118–122
116	12	June 23	8:15–? a.m.	42_1	32 42.8	117 29.5	4	made between
117	20	June 23	8:15–? a.m.	42_1	32 42.8	117 29.5	0	8:00 a.m. and
118	000	June 23	.....	42_1	32 42.8	117 29.5	365–0	noon
119	20	June 23	.....	42_1	32 42.8	117 29.5	355–0	
120	12	June 23	.....	42_1	32 42.8	117 29.5	310–0	
121	20	June 23	.....	42_1	32 42.8	117 29.5	265–0	
122	12	June 23	.....	42_1	32 42.8	117 29.5	210–0	
124	000	June 24	10:30–11:45 p.m.	40_1	32 36.2	117 21.5	0	
125	12	June 24	10:30–11:45 p.m.	40_1	32 36.2	117 21.5	0	
126	20	June 24	10:30–11:45 p.m.	40_1	32 36.2	117 21.5	0	
127	000	June 24	.....	40_1	32 36.2	117 21.5	0	

* This haul was originally accessioned under the number, 100a.

Table 5.—Data Relative to Plankton Hauls—(*Continued*)

Part A—Preliminary Plankton Collections

Haul number	Apparatus used	Date 1904	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Remarks
128	20	June 28	7:00 a.m.	41_7	32° 36.1	117° 22.7	120–0	
129	20	June 28	7:00 a.m.	41_7	32 36.1	117 22.7	185–0	
130	12	June 28	7:00 a.m.	41_7	32 36.1	117 22.7	82–0	
131	000	June 28	7:00 a.m.	41_7	32 36.1	117 22.7	190–0	
132	000	June 28	.....	41_7	32 36.1	117 22.7	0	Hauls 132–134
133	12	June 28	.....	41_7	32 36.1	117 22.7	155–0	made between
134	12	June 28	7:30–? a.m.	41_7	32 36.1	117 22.7	0	7:00 a.m. and
135	000	June 30	8:30 a.m.	41.5_9	32 44.7	117 27.5	310–0	noon
136	20	June 30	8:30 a.m.	41.5_9	32 44.7	117 27.5	300–0	
137	12	June 30	8:30 a.m.	41.5_9	32 44.7	117 27.5	255–0	
138	20	June 30	.....	41.5_9	32 44.7	117 27.5	210–0	Hauls 138–142
139	12	June 30	.....	41.5_9	32 44.7	117 27.5	165–0	made between
140	000	June 30	.....	41.5_9	32 44.7	117 27.5	0	8:30 a.m. and
141	20	June 30	.....	41.5_9	32 44.7	117 27.5	0	noon
142	12	June 30	.....	41.5_9	32 44.7	117 27.5	0	
143	000	July 5	10:00 a.m.	41_8	32 40.0	117 26.4	365–0	
144	20	July 5	10:00 a.m.	41_8	32 40.0	117 26.4	355–0	
145	12	July 5	10:00 a.m.	41_8	32 40.0	117 26.4	290–0	
146	12	July 5	.....	41_8	32 40.0	117 26.4	185–0	Hauls 146–150
147	20	July 5	.....	41_8	32 40.0	117 26.4	240–0	made between
148	12	July 5	.....	41_8	32 40.0	117 26.4	0	10:00 a.m. and
149	20	July 5	.....	41_8	32 40.0	117 26.4	0	2:00 p.m.
150	000	July 5	.....	41_8	32 40.0	117 26.4	0	
151	000	July 7	6:45 a.m.	41_7	32 36	117 27	165–0	
152	20	July 7	6:45 a.m.	41_7	32 36	117 27	150–0	
153	12	July 7	6:45 a.m.	41_7	32 36	117 27	120–0	
154	20	July 7	.....	41_7	32 36	117 27	82–0	Hauls 154 and 155
155	12	July 7	.....	41_7	32 36	117 27	46–0	made between
156	000	July 7	8:30–9:00 a.m.	41_7	32 36	117 27	18	7:00 and 8:00
157	12	July 7	8:30–9:00 a.m.	41_7	32 36	117 27	0	a.m.
158	000	July 7	9:10–9:30 a.m.	41_7	32 36	117 27	9	
159	12	July 7	9:10–9:30 a.m.	41_7	32 36	117 27	0	
160	20	July 7	9:10–9:30 a.m.	41_7	32 36	117 27	0	
161	12	July 9	6:00 a.m.	40_7	32 34.2	117 19.5	155–0	
162	12	July 9	.....	40_7	32 34.2	117 19.5	185–0	Hauls 162–170
163	12	July 9	.....	40_7	32 34.2	117 19.5	130–0	made between
164	20	July 9	6:00 a.m.	40_7	32 34.2	117 19.5	92–0	6:00 a.m. and
165	20	July 9	.....	40_7	32 34.2	117 19.5	82–0	noon
166	20	July 9	.....	40_7	32 34.2	117 19.5	165–0	
167	12	July 9	.....	40_7	32 34.2	117 19.5	0	
168	20	July 9	.....	40_7	32 34.2	117 19.5	0	
169	12	July 9	.....	40_7	32 34.2	117 19.5	0	
170	20	July 9	.....	40_7	32 34.2	117 19.5	0	
171	12	July 12	8:30 a.m.	41_6	32 30	117 23	46–0	
172	20	July 12	8:30 a.m.	41_6	32 30	117 23	100–0	
173	12	July 12	8:40 a.m.	41_6	32 30	117 23	135–0	
174	20	July 12	8:40 a.m.	41_6	32 30	117 23	175–0	
175	000	July 12	8:40 a.m.	41_6	32 30	117 23	190–0	
176	20	July 12	8:50–? a.m.	41_6	32 30	117 23	0	Hauls 176–178
177	12	July 12	8:50–? a.m.	41_6	32 30	117 23	0	ended before
178	000	July 12	8:50–? a.m.	41_6	32 30	117 23	0	10:00 a.m.
179	000	July 12	10:00–? a.m.	(39_8)	32 43.0	117 17.0	0	
180	12	July 12	10:00–? a.m.	(39_8)	32 43.0	117 17.0	0	
181	20	July 12	10:00–10:05 a.m.	(39_8)	32 43.0	117 16.0	0	Towed from row-
182	000	July 14	7:00 a.m.	39_7	32 32.8	117 15.0	82–0	boat in "brown
183	20	July 14	7:00 a.m.	39_7	32 32.8	117 15.0	73–0	water"
184	12	July 14	7:00 a.m.	39_7	32 32.8	117 15.0	46–0	
185	000	July 14	7:30–? a.m.	39_7	32 32.8	117 15.0	0	ended before
186	12	July 14	7:30–? a.m.	39_7	32 32.8	117 15.0	0	8:00 a.m.
187	20	July 14	7:30–? a.m.	39_7	32 32.8	117 15.0	0	Hauls 185–187
188	000	July 14	8:00–? a.m.	39_7	32 32.8	117 15.0	0	
189	12	July 14	8:00–? a.m.	39_7	32 32.8	117 15.0	0	
196	000	July 16	7:30–? a.m.	40.5_7	32 36.5	117 17.5	0	Towed in "red water"

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part A—Preliminary Plankton Collections

Haul number	Apparatus used	Date 1904	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Remarks
197	000	July 19	8:30–? p.m.	40.5$_7$	32° 36.5	117° 17.5	9	Haul ended before 11:45 p.m.
198	000	July 19	.....	40.5$_7$	32 36.5	117 17.5	9	Hauls 198–199
199	000	July 19	.....	40.5$_7$	32 36.5	117 17.5	18	made between
201	000	July 19	11:45 p.m.–?	40.5$_7$	32 36.5	117 17.5	6	8:30 and 11:45
202	12	July 19	11:45 p.m.–?	40.5$_7$	32 36.5	117 17.5	0	p.m.
205	000	July 21	6:00 a.m.	41$_7$	32 37.1	117 23.6	185–0	
206	20	July 21	6:00 a.m.	41$_7$	32 37.1	117 23.6	165 0	
207	12	July 21	6:00 a.m.	41$_7$	32 37.1	117 23.6	130–0	
208	20	July 21	6:00 a.m.	41$_7$	32 37.1	117 23.6	92 0	
209	12	July 21	6:00 a.m.	41$_7$	32 37.1	117 23.6	55 0	
210	000	July 21	7:00–? a.m.	41$_7$	32 37.1	117 23.6	18	Haul ended before 7:30 a.m.
211	000	July 21	7:30–? a.m.	41$_7$	32 37.1	117 23.6	9	Hauls 211–214
212	20	July 21	7:30–? a.m.	41$_7$	32 37.1	117 23.6	0	ended before
213	12	July 21	7:30–? a.m.	41$_7$	32 37.1	117 23.6	0	7:50 a.m.
214	12	July 21	7:30–? a.m.	41$_7$	32 37.1	117 23.6	0	
215	000	July 21	7:50–? a.m.	41$_7$	32 37.1	117 23.6	4	
216	000	July 23	9:30–? p.m.	40$_7$	32 35.0	117 18.8	0	Hauls 216–221
217	000	July 23	.....	40$_7$	32 35.0	117 18.8	9	made between
218	000	July 23	.....	40$_7$	32 35.0	117 18.8	9	9:30 p.m. and
219	000	July 23	.....	40$_7$	32 35.0	117 18.8	18	12:15 a.m.
220	12	July 23	9:30–? p.m.	40$_7$	32 35.0	117 18.8	0	
221	12	July 23	9:30–? p.m.	40$_7$	32 35.0	117 18.8	0	
222	000	July 26	7:30 a.m.	41$_8$	32 38.5	117 25.0	185 0	
223	20	July 26	7:30 a.m.	41$_8$	32 38.5	117 25.0	165–0	
224	20	July 26	7:30 a.m.	41$_8$	32 38.5	117 25.0	92–0	
225	12	July 26	7:30 a.m.	41$_8$	32 38.5	117 25.0	55 0	
226	000	July 26	.....	41$_7$	32 38.5	117 25.0	18	Hauls 226–229
227	12	July 26	.....	41$_7$	32 38.5	117 25.0	0	made between
228	000	July 26	.....	41$_7$	32 38.5	117 25.0	0	7:30 and 10:30
229	12	July 26	.....	41$_7$	32 38.5	117 25.0	0	a.m.
230	000	July 28	6:00–? a.m.	40$_7$	32 38.8	117 21.7	0	Hauls 230–233
231	000	July 28	.....	40$_7$	32 38.8	117 21.7	0	made between
232	000	July 28	.....	40$_7$	32 38.8	117 21.7	0	6:00 and 10:00
233	000	July 28	.....	40$_7$	32 38.8	117 21.7	0	a.m.
234	000	Aug. 8	9:30–? a.m.	40$_7$	32 34.2	117 19.5	9	Hauls 234–236
235	000	Aug. 8	.....	40$_7$	32 34.2	117 19.5	18	made between
236	000	Aug. 8	.....	40$_7$	32 34.2	117 19.5	4	9:30 and 11:30 a.m.
237	20	Aug. 19	7:00–? a.m.	40$_8$	32 38.7	117 22.2	0	Hauls 237–244
238	000	Aug. 19	7:00–? a.m.	40$_8$	32 38.7	117 22.2	9	made between
239	000	Aug. 19	.....	40$_8$	32 38.7	117 22.2	9	7:00 and 10:00
240	000	Aug. 19	.....	40$_8$	32 38.7	117 22.2	4	a.m.
241	000	Aug. 19	.....	40$_8$	32 38.7	117 22.2	18	
242	000	Aug. 19	.....	40$_8$	32 38.7	117 22.2	9	
243	000	Aug. 19	.....	40$_8$	32 38.7	117 22.2	4	
244	12	Aug. 19	.....	40$_8$	32 38.7	117 22.2	0	
245	000	Aug. 27	7:00–? a.m.	40$_7$	32 36.7	117 20.7	0	Hauls 245–251
246	12	Aug. 27	7:00–? a.m.	40$_7$	32 36.7	117 20.7	0	made between
247	20	Aug. 27	7:00–? a.m.	40$_7$	32 36.7	117 20.7	0	7:00 and 10:00
248	000	Aug. 27	.....	40$_7$	32 36.7	117 20.7	0	a.m.
249	000	Aug. 27	.....	40$_7$	32 36.7	117 20.7	9	
250	000	Aug. 27	.....	40$_7$	32 36.7	117 20.7	9	
251	000	Aug. 27	.....	40$_7$	32 36.7	117 20.7	18	
252½	000	Sept. 2	5:30–6:00 a.m.	B	32 41.1	117 14.0	0	
253	12	Sept. 2	5:30–6:00 a.m.	B	32 41.1	117 14.0	0	
254	20	Sept. 2	5:30–6:00 a.m.	B	32 41.1	117 14.0	0	
255	000	Sept. 2	6:10 6:30 a.m.	B	32 41.6	117 14.2	10	
256	12	Sept. 2	6:10–6:30 a.m.	B	32 41.6	117 14.2	0	
257	20	Sept. 2	6:10 6:30 a.m.	B	32 41.6	117 14.2	0	
258	12	Sept. 2	6:50–7:20 a.m.	B	32 42.0	117 14.3	0	
259	20	Sept. 2	6:50–7:20 a.m.	B	32 42.0	117 14.3	0	

Table 5.—Data Relative to Plankton Hauls—(*Continued*)

Part A—Preliminary Plankton Collections

Haul number	Apparatus used	Date 1904	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Remarks
260	000	Sept. 2	.....	B	32° 41.6	117° 14.2	10	Made between 7:20 and 8:30 a.m.
261	000	Sept. 10	6:00 a.m.	40_7	32 37.4	117 22.3	165–0	Hauls 261–268
262	000	Sept. 10	.....	40_7	32 37.4	117 22.3	18	made between
263	000	Sept. 10	.....	40_7	32 37.4	117 22.3	92–0	6:00 and 9:00
264	000	Sept. 10	.....	40_7	32 37.4	117 22.3	0	a.m.
265	12	Sept. 10	6:00 a.m.	40_7	32 37.4	117 22.3	92–0	
266	12	Sept. 10	.....	40_7	32 37.4	117 22.3	92–0	
267	20	Sept. 10	6:00 a.m.	40_7	32 37.4	117 22.3	130–0	
268	20	Sept. 10	.....	40_7	32 37.4	117 22.3	0	
269	12	Sept. 17	6:00 a.m.	41_8	32 38.6	117 24.0	110–0	
270	12	Sept. 17	9:40–10:00 a.m.	41_8	32 38.6	117 24.0	4	
271	20	Sept. 17	6:00 a.m.	41_8	32 38.6	117 24.0	145–0	
272	20	Sept. 17	9:40–10:00 a.m.	41_8	32 38.6	117 24.0	0	
273	000	Sept. 17	6:00 a.m.	41_8	32 38.6	117 24.0	185–0	
274	000	Sept. 17	.....	41_8	32 38.6	117 24.0	18	Made between 6:00
275	000	Sept. 17	9:40–10:00 a.m.	41_8	32 38.6	117 24.0	0	and 9:40 a.m.
276	20	Sept. 24	6:00 a.m.	41_9	32 45.4	117 23.5	135–0	Hauls 276–282
277	12	Sept. 24	6:00 a.m.	41_9	32 45.4	117 23.5	100–0	made between
278	12	Sept. 24	.....	41_9	32 45.4	117 23.5	9	6:00 and 10:00
279	20	Sept. 24	.....	41_9	32 45.5	117 23.5	0	a.m.
280	000	Sept. 24	6:00 a.m.	41_9	32 45.4	117 23.5	175–0	
281	000	Sept. 24	.....	41_9	32 45.4	117 23.5	18	
282	000	Sept. 24	.....	41_9	32 45.4	117 23.5	9	
283	20	Oct. 1	8:00 a.m.	41_8	32 38.6	117 24.0	130–0	Hauls 283–288
284	12	Oct. 1	8:00 a.m.	41_8	32 38.6	117 24.0	92–0	made between
285	12	Oct. 1	.....	41_8	32 38.6	117 24.0	0	8:00 a.m. and
286	000	Oct. 1	8:00 a.m.	41_8	32 38.6	117 24.0	165–0	noon
287	000	Oct. 1	.....	41_8	32 38.6	117 24.0	18	
288	000	Oct. 1	.....	41_8	32 38.6	117 24.0	0	
289	000	Oct. 20	9:00 a.m.	41_8	32 38.5	117 25.0	145–0	Hauls 289–296
290	000	Oct. 20	.....	41_8	32 38.5	117 25.0	18	made between
291	000	Oct. 20	.....	41_8	32 38.5	117 25.0	9	9:00 a.m. and
292	20	Oct. 20	9:00 a.m.	41_8	32 38.5	117 25.0	110–0	noon
293	20	Oct. 20	.....	41_8	32 38.5	117 25.0	4	
294	12	Oct. 20	9:00 a.m.	41_8	32 38.5	117 25.0	73–0	
295	12	Oct. 20	.....	41_8	32 38.5	117 25.0	9	
296	12	Oct. 20	.....	41_8	32 38.5	117 25.0	4	
297	000	Oct. 28	9:45 a.m.	41_7	32 34.6	117 24.8	165–0	
298	000	Oct. 28	.....	41_7	32 34.6	117 24.8	18	Hauls 298 and 301
299	000	Oct. 28	12:10–12:30 p.m.	41_7	32 34.6	117 24.8	0	made between
300	12	Oct. 28	9:45 a.m.	41_7	32 34.6	117 24.8	92–0	9:45 a.m. and
301	12	Oct. 28	.....	41_7	32 34.6	117 24.8	0	12:10 p.m.
302	12	Oct. 28	12:10–12:30 p.m.	41_7	32 34.6	117 24.8	0	
303	20	Oct. 28	9:45 a.m.	41_7	32 34.6	117 24.8	130–0	
304	20	Oct. 28	12:10–12:30 p.m.	41_7	32 34.6	117 24.8	0	
305	000	Nov. 4	10:30 a.m.	41_8	32 42.3	117 26.0	165–0	
306	000	Nov. 4	.....	41_8	32 42.3	117 26.0	18	Made between
307	000	Nov. 4	12:40–1:00 p.m.	41_8	32 42.3	117 26.0	0	10:30 a.m. and
308	20	Nov. 4	10:30 a.m.	41_8	32 42.3	117 26.0	130–0	12:40 p.m.
309	20	Nov. 4	12:40–1:00 p.m.	41_8	32 42.3	117 26.0	0	
310	12	Nov. 4	10:30 a.m.	41_8	32 42.3	117 26.0	92–0	
311	12	Nov. 4	.....	41_8	32 42.3	117 26.0	9	Made between
312	12	Nov. 4	12:40–1:00 p.m.	41_8	32 42.3	117 26.0	0	10:30 a.m. and
313	000	Nov. 12	7:00 a.m.	40_9	32 44.0	117 21.3	110–0	12:40 p.m.
314	000	Nov. 12	.....	40_9	32 44.0	117 21.3	18	Made between
315	000	Nov. 12	10:40–11:00 a.m.	40_9	32 44.0	117 21.3	0	7:00 and 10:40
316	20	Nov. 12	7:00 a.m.	40_9	32 44.0	117 21.3	82–0	a.m.
317	20	Nov. 12	10:40–11:00 a.m.	40_9	32 44.0	117 21.3	0	
318	12	Nov. 12	7:00 a.m.	40_9	32 44.0	117 21.3	46–0	
319	12	Nov. 12	.....	40_9	32 44.0	117 21.3	9	Made between 7:00
320	12	Nov. 12	10:40–11:00 a.m.	40_9	32 44.0	117 21.3	0	and 10:40 a.m.

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part A—Preliminary Plankton Collections

Haul number	Apparatus used	Date 1904	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Remarks
321	000	Nov. 18	8:00 a.m.	41,	32° 36.3	117° 25.8	185–0	Hauls 321–328
322	000	Nov. 18	.....	41,	32 36.3	117 25.8	0	made between
323	000	Nov. 18	.....	41,	32 36.3	117 25.8	0	8:00 a.m. and
324	20	Nov. 18	8:00 a.m.	41,	32 36.3	117 25.8	145–0	noon
325	20	Nov. 18	.....	41,	32 36.3	117 25.8	0	
326	12	Nov. 18	8:00 a.m.	41,	32 36.3	117 25.8	110–0	
327	12	Nov. 18	.....	41,	32 36.3	117 25.8	0	
328	12	Nov. 18	.....	41,	32 36.3	117 25.8	0	
329	000	Nov. 26	8:00 a.m.	41,	32 38.3	117 25.1	185–0	Hauls 329–336
330	000	Nov. 26	.....	41,	32 38.3	117 25.1	0	made between
331	000	Nov. 26	.....	41,	32 38.3	117 25.1	0	8:00 a.m. and
332	20	Nov. 26	8:00 a.m.	41,	32 38.3	117 25.1	145–0	noon
333	20	Nov. 26	.....	41,	32 38.3	117 25.1	0	
334	12	Nov. 26	8:00 a.m.	41,	32 38.3	117 25.1	110–0	
335	12	Nov. 26	.....	41,	32 38.3	117 25.1	0	
336	12	Nov. 26	.....	41,	32 38.3	117 25.1	0	
337	000	Dec. 2	8:00–? a.m.	40,	32 35.5	117 17.6	27	Hauls 337–345
338	000	Dec. 2	.....	40,	32 35.5	117 17.6	0	made between
339	000	Dec. 2	.....	40,	32 35.5	117 17.6	0	8:00 a.m. and
340	20	Dec. 2	8:00–? a.m.	40,	32 35.5	117 17.6	0	noon
341	20	Dec. 2	.....	40,	32 35.5	117 17.6	0	
342	20	Dec. 2	.....	40,	32 35.5	117 17.6	0	
343	12	Dec. 2	8:00–? a.m.	40,	32 35.5	117 17.6	18	
344	12	Dec. 2	.....	40,	32 35.5	117 17.6	0	
345	12	Dec. 2	.....	40,	32 35.5	117 17.6	0	
346	000	Dec. 12	8:00 a.m.	42,	32 43.0	117 29.6	185–0	Hauls 346–353
347	000	Dec. 12	.....	42,	32 43.0	117 29.6	0	made between
348	000	Dec. 12	.....	42,	32 43.0	117 29.6	0	8:00 a.m. and
349	20	Dec. 12	8:00 a.m.	42,	32 43.0	117 29.6	145–0	noon
350	20	Dec. 12	.....	42,	32 43.0	117 29.6	0	
351	12	Dec. 12	8:00 a.m.	42,	32 43.0	117 29.6	110 0	
352	12	Dec. 12	.....	42,	32 43.0	117 29.6	0	
353	12	Dec. 12	.....	42,	32 43.0	117 29.6	0	
354	000	Dec. 17	8:00 a.m.	(38,)	32 34.7	117 11.0	73–0	Hauls 354–361
355	000	Dec. 17	.....	(38,)	32 34.7	117 11.0	0	made between
356	000	Dec. 17	.....	(38,)	32 34.7	117 11.0	0	8:00 a.m. and
357	20	Dec. 17	8:00 a.m.	(38,)	32 34.7	117 11.0	55 0	noon
358	20	Dec. 17	.....	(38,)	32 34.7	117 11.0	0	
359	12	Dec. 17	8:00 a.m.	(38,)	32 34.7	117 11.0	37–0	
360	12	Dec. 17	.....	(38,)	32 34.7	117 11.0	0	
361	12	Dec. 17	.....	(38,)	32 34.7	117 11.0	0	
362	000	Dec. 28	8:00 a.m.	42,	32 40.2	117 28.8	185–0	Hauls 362–369
363	000	Dec. 28	.....	42,	32 40.2	117 28.8	0	made between
364	000	Dec. 28	.....	42,	32 40.2	117 28.8	0	8:00 a.m. and
365	20	Dec. 28	8:00 a.m.	42,	32 40.2	117 28.8	145–0	noon
366	20	Dec. 28	.....	42,	32 40.2	117 28.8	0	
367	12	Dec. 28	8:00 a.m.	42,	32 40.2	117 28.8	110–0	
368	12	Dec. 28	.....	42,	32 40.2	117 28.8	0	
369	12	Dec. 28	.....	42,	32 40.2	117 28.8	0	
370	000	1905 Jan. 12	8:00 a.m.	41.5,	32 38.0	117 27.5	185–0	Hauls 370–377
371	000	Jan. 12	.....	41.5,	32 38.0	117 27.5	0	made between
372	000	Jan. 12	.....	41.5,	32 38.0	117 27.5	0	8:00 a.m. and
373	20	Jan. 12	8:00 a.m.	41.5,	32 38.0	117 27.5	145–0	noon
374	20	Jan. 12	.....	41.5,	32 38.0	117 27.5	0	
375	12	Jan. 12	8:00 a.m.	41.5,	32 38.0	117 27.5	110–0	
376	12	Jan. 12	.....	41.5,	32 38.0	117 27.5	0	
377	12	Jan. 12	.....	41.5,	32 38.0	117 27.5	0	
378	20	Jan. 14	.....	B	32 41.5	117 14.2	0	Towed 20 minutes; tide falling
379	000	Jan. 20	8:00 a.m.	39,	32 37.1	117 14.6	46–0	Hauls 379–386
380	000	Jan. 20	.....	39,	32 37.1	117 14.6	0	made between
381	000	Jan. 20	.....	39,	32 37.1	117 14.6	0	8:00 a.m. and
382	20	Jan. 20	8:00 a.m.	39,	32 37.1	117 14.6	37–0	noon

Table 5.—Data Relative to Plankton Hauls—(*Continued*)

Part A—Preliminary Plankton Collections

Haul number	Apparatus used	Date 1904	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Remarks
383	20	Jan. 20		39_7	32° 37.1	117° 14.6	0	
384	12	Jan. 20	8:00 a.m.	39_7	32 37.1	117 14.6	27–0	
385	12	Jan. 20		39_7	32 37.1	117 14.6	0	
386	12	Jan. 20		39_7	32 37.1	117 14.6	0	
387	20	Jan. 22	10:00–10:30 a.m.	B	32 42.9	117 13.2	0	Tide falling
388	000	Jan. 27	8:00 a.m.	41_1	32 45.0	117 23.3	110–0	Hauls 388–393
389	000	Jan. 27		41_4	32 45.0	117 23.3	0	made between
390	20	Jan. 27	8:00 a.m.	41_6	32 45.0	117 23.3	82 0	8:00 a.m. and
391	20	Jan. 27		41_1	32 45.0	117 23.3	0	noon
392	12	Jan. 27	8:00 a.m.	41_1	32 45.0	117 23.3	55–0	
393	12	Jan. 27		41_4	32 45.0	117 23.3	0	
394	20	Jan. 30	10:00–10:25 a.m.	B	32 42.9	117 13.2	0	Tide falling
395	20	Feb. 8	10:00–10:20 a.m.	B	32 42.9	117 13.2	0	
396	000	Feb. 10	6:00 a.m.	39_6	32 31.4	117 13.1	64–0	Hauls 396–402
397	000	Feb. 10		39_6	32 31.4	117 13.1	0	made between
398	000	Feb. 10		39_6	32 31.4	117 13.1	0	6:00 and 10:00
399	20	Feb. 10	6:00 a.m.	39_6	32 31.4	117 13.1	55–0	a.m.
400	20	Feb. 10	6:00 a.m.	39_6	32 31.4	117 13.1	37–0	
401	20	Feb. 10		39_6	32 31.4	117 13.1	0	
402	20	Feb. 10		39_6	32 31.4	117 13.1	0	
403	000	Feb. 18	6:00–? a.m.	41_5	32 40.2	117 24.1	0	Hauls 403–410
404	000	Feb. 18		41_5	32 40.2	117 24.1	130–0	made between
405	000	Feb. 18		41_5	32 40.2	117 24.1	0	6:00 and 10:00
406	12	Feb. 18	6:00–? a.m.	41_5	32 40.2	117 24.1	0	a.m.
407	12	Feb. 18		41_5	32 40.2	117 24.1	55–0	
408	12	Feb. 18		41_5	32 40.2	117 24.1	0	
409	20	Feb. 18	6:00 ? a.m.	41_5	32 40.2	117 24.1	92 0	
410	20	Feb. 18		41_5	32 40.2	117 24.1	0	
411	000	Feb. 25	6:00 ? a.m.	42_3	32 40.6	117 30.0	0	Hauls 411–417
412	000	Feb. 25		42_3	32 40.6	117 30.0	0	made between
413	000	Feb. 25		42_3	32 40.6	117 30.0	185–0	6:00 and 10:00
414	12	Feb. 25	6:00–? a.m.	42_3	32 40.6	117 30.0	0	a.m.
415	12	Feb. 25		42_3	32 40.6	117 30.0	110–0	
416	20	Feb. 25	6:00–? a.m.	42_3	32 40.6	117 30.0	0	
417	20	Feb. 25		42_3	32 40.6	117 30.0	145–0	
418	000	Mar. 6	6:00 ? a.m.	42_1	32 37.9	117 28.7	0	Hauls 418–423
419	000	Mar. 6		42_1	32 37.9	117 28.7	175 0	made between
420	12	Mar. 6	6:00–? a.m.	42_1	32 37.9	117 28.7	0	6:00 and 10:00
421	12	Mar. 6		42_1	32 37.9	117 28.7	100 0	a.m.
422	20	Mar. 6	6:00 ? a.m.	42_1	32 37.9	117 28.7	0	
423	20	Mar. 6		42_1	32 37.9	117 28.7	135–0	
424	000	Mar. 11	6:00 ? a.m.	41_3	32 44.5	117 26.4	0	Hauls 424–431
425	000	Mar. 11		41_3	32 44.5	117 26.4	0	made between
426	000	Mar. 11		41_3	32 44.5	117 26.4	165 0	6:00 and 10:00
427	12	Mar. 11	6:00–? a.m.	41_3	32 44.5	117 26.4	0	a.m.
428	12	Mar. 11		41_3	32 44.5	117 26.4	0	
429	12	Mar. 11		41_1	32 44.5	117 26.4	92–0	
430	20	Mar. 11	6:00 ? a.m.	41_3	32 44.5	117 26.4	0	
431	20	Mar. 11		41_3	32 44.5	117 26.4	130–0	
432	000	Mar. 18	6:00–? a.m.	41.5	32 38.0	117 27.5	0	Hauls 432–437
433	000	Mar. 18		41.5	32 38.0	117 27.5	0	made between
434	000	Mar. 18		41.5	32 38.0	117 27.5	185–0	6:00 and 10:00
435	12	Mar. 18	6:00–? a.m.	41.5	32 38.0	117 27.5	0	a.m.
436	12	Mar. 18		41.5	32 38.0	117 27.5	110–0	
437	20	Mar. 18		41.5	32 38.0	117 27.5	145–0	
438	000	Mar. 25		42_2	32 42.6	117 28.4	0	Hauls 438–443
439	000	Mar. 25		42_2	32 42.6	117 28.4	165 0	made between
440	12	Mar. 25		42_2	32 42.6	117 28.4	0	6:00 and 10:00
441	12	Mar. 25		42_2	32 42.6	117 28.4	100–0	a.m.
442	20	Mar. 25		42_2	32 42.6	117 28.4	0	
443	20	Mar. 25		42_2	32 42.6	117 28.4	135–0	
444	000	Apr. 1	6:00–? a.m.	41_7	32 34.0	117 25.8	0	Hauls 444–450
445	000	Apr. 1		41_7	32 34.0	117 25.8	0	made between
446	000	Apr. 1		41_7	32 34.0	117 25.8	185–0	6:00 and 10:00
447	12	Apr. 1	6:00–? a.m.	41_7	32 34.0	117 25.8	0	a.m.

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part A—Preliminary Plankton Collections

Haul number	Apparatus used	Date	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Remarks
		1904						
448	12	Apr. 1	.....	41_7	32° 34.0	117° 25.8	110–0	
449	20	Apr. 1	6:00–? a.m.	41_7	32 34.0	117 25.8	0	
450	20	Apr. 1	.....	41_7	32 34.0	117 25.8	145–0	
451	000	Apr. 8	6:00–? a.m.	39_7	32 36.5	117 17.4	0	Hauls 451–460
452	000	Apr. 8	.....	39_7	32 36.5	117 17.4	0	made between
453	000	Apr. 8	.....	39_7	32 36.5	117 17.4	0	6:00 and 10:00
454	000	Apr. 8	.....	39_7	32 36.5	117 17.4	73–0	a.m.
455	12	Apr. 8	6:00–? a.m.	39_7	32 36.5	117 17.4	0	
456	12	Apr. 8	.....	39_7	32 36.5	117 17.4	0	
457	12	Apr. 8	.....	39_7	32 36.5	117 17.4	0	
458	12	Apr. 8	.....	39_7	32 36.5	117 17.4	37–0	
459	20	Apr. 8	6:00–? a.m.	39_7	32 36.5	117 17.4	0	
460	20	Apr. 8	.....	39_7	32 36.5	117 17.4	55–0	
461	000	Apr. 15	.....	41.5_7	32 44.8	117 27.5	0	Hauls 461–466
462	000	Apr. 15	.....	41.5_7	32 44.8	117 27.5	200–0	made between
463	12	Apr. 15	.....	41.5_7	32 44.8	117 27.5	0	6:00 and 10:00
464	12	Apr. 15	.....	41.5_7	32 44.8	117 27.5	130–0	a.m.
465	20	Apr. 15	.....	41.5_7	32 44.8	117 27.5	0	
466	20	Apr. 15	.....	41.5_7	32 44.8	117 27.5	165–0	Hauls 467–472
467	000	Apr. 22	.....	39_7	32 35.0	117 16.0	0	made between
468	000	Apr. 22	.....	39_7	32 35.0	117 16.0	82–0	6:00 and 10:00
469	12	Apr. 22	.....	39_7	32 35.0	117 16.0	0	a.m.
470	12	Apr. 22	.....	39_7	32 35.0	117 16.0	55–0	
471	20	Apr. 22	.....	39_7	32 35.0	117 16.0	0	
472	20	Apr. 22	.....	39_7	32 35.0	117 16.0	73–0	
473	000	Apr. 29	.....	41_9	32 45.2	117 23.2	0	Hauls 473–478
474	000	Apr. 29	.....	41_9	32 45.2	117 23.2	185–0	made between
475	12	Apr. 29	.....	41_9	32 45.2	117 23.2	0	6:00 and 10:00
476	12	Apr. 29	.....	41_9	32 45.2	117 23.2	110–0	a.m.
477	20	Apr. 29	.....	41_9	32 45.2	117 23.2	0	
478	20	Apr. 29	.....	41_9	32 45.2	117 23.2	145–0	
479	000	May 6	.....	$(40)_{9.5}$	32 47.5	117 20.2	0	Hauls 479–484
480	000	May 6	.....	$(40)_{9.5}$	32 47.5	117 20.2	130–0	made between
481	12	May 6	.....	$(40)_{9.5}$	32 47.5	117 20.2	0	6:00 and 10:00
482	12	May 6	.....	$(40)_{9.5}$	32 47.5	117 20.2	73–0	a.m.
483	20	May 6	.....	$(40)_{9.5}$	32 47.5	117 20.2	0	
484	20	May 6	.....	$(40)_{9.5}$	32 47.5	117 20.2	100–0	
485	000	May 13	.....	40_8	32 38.8	117 21.6	0	Hauls 485–491
486	000	May 13	.....	40_8	32 38.8	117 21.6	0	made between
487	000	May 13	.....	40_8	32 38.8	117 21.6	110–0	6:00 and 10:00
488	12	May 13	.....	40_8	32 38.8	117 21.6	0	a.m.
489	12	May 13	.....	40_8	32 38.8	117 21.6	73–0	
490	20	May 13	.....	40_8	32 38.8	117 21.6	0	
491	20	May 13	.....	40_8	32 38.8	117 21.6	92–0	
492	000	May 20	.....	39_7	32 36.5	117 17.4	0	Hauls 492–497
493	000	May 20	.....	39_7	32 36.5	117 17.4	0	made between
494	000	May 20	.....	39_7	32 36.5	117 17.4	82–0	6:00 and 10:00
495	12	May 20	.....	39_7	32 36.5	117 17.4	46–0	a.m.
496	20	May 20	.....	39_7	32 36.5	117 17.4	0	
497	20	May 20	.....	39_7	32 36.5	117 17.4	64–0	
		1901						
500	.....	June 21	.....	52_{16}	33 21	118 18	0	
501	.....	June 21	8:00–? p.m.	54_{17}	33 24	118 31	0	
502	000	May 22	11:00–11:15 a.m.	52_{20}	33 42.0	118 18.0	0	
503	20	May 29	5:00–? a.m.	(51_{21})	33 43.3	118 16.3	0	
504	20	May 30	5:00–? a.m.	(51_{21})	33 43.3	118 16.3	0	Drizzling
505	20	May 31	5:00–? a.m.	(51_{21})	33 43.3	118 16.3	0	Drizzling
506	000	June 1	5:00–5:55 a.m.	(51_{21})	33 43.3	118 16.3	0	Light fog
507	000	June 2	6:30–? a.m.	(51_{21})	33 43.3	118 16.3	0	Heavy fog
508	000	June 3	4:50–? a.m.	(51_{21})	33 43.3	118 16.3	0	Cloudy
509	000	June 5	6:30–? a.m.	(51_{21})	33 43.3	118 16.3	0	
510	000	June 6	8:30–? a.m.	(51_{21})	33 43.3	118 16.3	0	
511	000	June 7	5:10–? a.m.	(51_{21})	33 43.3	118 16.3	0	
512	000	June 8	7:00–8:00 a.m.	52_{20}	33 39.3	118 17.8	0	

Table 5.—Data Relative to Plankton Hauls—(*Continued*)

Part A—Preliminary Plankton Collections

Haul number	Apparatus used	Date	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Remarks
		1901						
513	.....	June 8	.....	(51$_{21}$)	33° 43.3	118° 16.3	0	
514	000	June 9	6:00–? a.m.	52$_{20}$	33 39.3	118 17.8	0	
515	000	June 10	5:15–? a.m.	52$_{20}$	33 39.3	118 17.8	0	
516	000	June 11	5:35–? a.m.	(51$_{21}$)	33 43.3	118 16.3	0	
517	.....	June 12	.....	(51$_{21}$)	33 43.3	118 16.3	0	
518	000	June 12	5:00–5:20 a.m.	52$_{20}$	33 39.3	118 17.8	0	
519	.....	June 14	.....	(53$_{24}$)	33 34.4	117 56.2	0	
520	20	June 14	5:00–5:20 a.m.	52$_{20}$	33 39.3	118 17.8	0	
521	20	June 15	5:10–? a.m.	52$_{20}$	33 39.3	118 17.8	0	
522	.....	June 15	.....	.....	.....	.....	0	Off San Pedro
523	.....	June 16	.....	.....	.....	.....	0	Off San Pedro
524	20	June 17	5:00–? a.m.	52$_{20}$	33 39.3	118 17.8	0	
525	20	July 1	.....	.....	.....	.....	0	Two gallons "red water" filtered
526	20	June 18	5:00–? a.m.	52$_{20}$	33 39.3	118 17.8	0	
527	20	June 19	5:00–? a.m.	52$_{20}$	33 39.3	118 17.8	0	
528	.....	June 19	6:00–? a.m.	52$_{16}$	33 20.5	118 19.0	0	
529	.....	June 20	.....	52$_{17}$	33 25.0	118 22.0	0	Dip-net haul
530	.....	June 20	.....	52$_{17}$	33 25.0	118 22.0	0	Tow
531	20	June 20	5:15–? a.m.	52$_{20}$	33 39.3	118 17.8	0	
532	20	June 21	5:10–? a.m.	52$_{20}$	33 39.3	118 17.8	0	
533	.....	June 21	1:00–? p.m.	.....	.....	.....	0	
534	.....	June 22	2:00–? p.m.	.....	.....	.....	0	High tide
535	000	June 22	.....	52$_{17}$	33 25.6	118 20.0	550–0	
536	000	June 22	.....	52$_{17}$	33 25.6	118 20.0	0	Haul ended at 33° 25.3 N and 118° 20.5 W
537	20	June 24	5:00–? a.m.	52$_{20}$	33 39.3	118 17.8	0	
538	.....	June 24	.....	.....	.....	.....	0	
539	20	June 25	5:00–? a.m.	52$_{20}$	33 39.3	118 17.8	0	
540	20	June 25	6:00–? a.m.	52$_{20}$	33 39.3	118 17.8	0	
541	.....	June 25	.....	.....	.....	.....	0	Off Santa Catalina
542	....	June 26	.....	.....	.....	.....	0	Off Santa Catalina
543	.....	June 29	.....	.....	.....	.....	0	Off Santa Catalina
544	20	June 30	5:00–? a.m.	52$_{20}$	33 39.3	118 17.8	0	
545	20	July 1	5:00–? a.m.	52$_{20}$	33 39.3	118 17.8	0	
546	000	July 2	.....	(51$_{21}$)	33 43.4	118 16.2	0	
547	20	July 2	5:00–? a.m.	52$_{20}$	33 39.3	118 17.8	0	
548	20	July 3	5:00 a.m.	52$_{20}$	33 39.3	118 17.8	0	
549	20	July 4	5:30–? a.m.	52$_{20}$	33 39.3	118 17.8	0	
550	20	July 5	6:00–? a.m.	52$_{20}$	33 39.3	118 17.8	0	
551	20	July 6	5:00–? a.m.	52$_{20}$	33 39.3	118 17.8	0	
552	20	July 11	5:00–? a.m.	52$_{20}$	33 39.3	118 17.8	0	
553	20	July 12	5:00–? a.m.	52$_{20}$	33 39.3	118 17.8	0	
554	20	July 13	5:00–? a.m.	52$_{20}$	33 39.3	118 17.8	0	
555	20	July 14	5:00–? a.m.	52$_{20}$	33 39.3	118 17.8	0	
556	000	July 16	8:20–8:40 a.m.	(38$_{8}$)	32 39.0	117 11.0	0	
557	.....	July 16	.....	.....	.....	.....	0	Off San Diego
558	.....	July 16	.....	.....	.....	.....	0	Off San Diego
559	.....	July 17	.....	.....	.....	.....	0	Off San Diego
560	....	July 18	.....	.....	.....	.....	0	Off San Diego
561	.....	July 19	1:05–1:35 p.m.	39$_{7}$	32 22.8	117 15.2	0	
562	.....	July 20	.....	.....	.....	.....	0	Off San Diego in "red water"
563	....	July 20	9:20–10:00 a.m.	39$_{7}$	32 37.0	117 15.0	0	
564	000	July 22	8:40–9:40 a.m.	39$_{7}$	32 37.0	117 15.0	0	
565	.....	July 22	.....	39$_{7}$	32 37.0	117 15.0	0	In "red water"
566	000	July 24	9:20 a.m.	39$_{7}$	32 37.0	117 15.0	85–0	
567	000	July 24	11:25–11:59 a.m.	39$_{7}$	32 37.0	117 15.0	0	
568	000	July 25	9:40 a.m.	39$_{7}$	32 37.0	117 15.0	240–0	
569	....	July 26	.....	B	32 41.0	117 14.0	0	
570	000	July 27	8:15 a.m.	(39.5$_{11}$)	32 53.0	117 17.5	225–0	
571	....	July 27	.....	B	32 41.0	117 14.0	0	
572	000	July 27	9:05 a.m.	(39$_{10}$)	32 51.8	117 16.5	120–0	
573	000	July 31	8:30 a.m.	(39$_{13}$)	32 52.6	117 17.2	230–0	
		1902						
574	....	July 27	11:00–? a.m.	(51$_{3}$)	33 43.6	118 16.8	0	
575	....	July 2	7:00–? a.m.	(51$_{3}$)	33 43.6	118 16.8	0	

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part A—Preliminary Plankton Collections

Haul number	Apparatus used	Date	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Remarks
		1902						
576	.....	July 3	7:00–? a.m.	(51_{21})	33° 43.6	118° 16.8	0	
577	.....	July 4	.....	(51_{21})	33 43.6	118 16.8	0	
578	.....	July 5	.....	.....	.....	.....	0	Off San Pedro
579	.....	July 10	.....	.....	.....	.....	0	Off San Pedro
580	.....	July 12	.....	.....	.....	.....	0	Off San Pedro
581	.....	July 12	.....	(51_{21})	33 43.7	118 16.8	0	Tide rising
582	.....	July 12	.....	(51_{21})	33 43.2	118 17.0	0	Tide rising
583	.....	July 19	.....	(51_{21})	33 43.2	118 17.0	0	
584	.....	July 19	.....	(51_{21})	33 43.6	118 16.7	0	
585	.....	July 21	.....	52_{26}	33 40.0	118 20.0	0	
586*	.....	July 29	7:30–? a.m.	.....	.....	.....	0	Off San Pedro
590	.....	Aug. 1	.....	.....	.....	.....	0	Off San Pedro
591	.....	Sept. 5	.....	.....	.....	.....	0	Off San Pedro
592	.....	Sept. 18	.....	(51_{21})	33 43.6	118 16.8	0	
593	.....	Nov. 1	.....	(51_{21})	33 43.6	118 16.8	0	
		1903						
594	.....	June 26	.....	.....	.....	.....	0	Off San Diego
595	12	June 27	.....	.....	.....	.....	0	Off San Diego
596	P.F.	June 27	.....	39_7	32 35.0	117 17.0	0	
597	P.12	June 27	.....	39_7	32 35.0	117 17.0	77	
598	P.F.	June 27	.....	39_7	32 35.0	117 17.0	92	
599	P.12	June 29	.....	40_7	32 33.0	117 20.0	130	
600	12	June 29	.....	40_7	32 33.0	117 20.0	130–0	
601	000	June 29	.....	40_7	32 33.0	117 20.0	130–0	
602	P.F.	June 29	.....	40_7	32 33.0	117 20.0	62	
603	P.F.	June 29	.....	40_7	32 33.0	117 20.0	0	
604	P.F.	June 29	.....	.....	.....	.....	130	Off San Diego
606	P.D.	June 30	.....	39_8	32 32.0	117 17.0	0	
607	P.F.	June 30	.....	39_8	32 32.0	117 17.0	62	
608	P.F.	June 30	.....	39_8	32 32.0	117 17.0	130	
609	12	June 30	.....	39_8	32 32.0	117 17.0	130–0	
610	P.F.	June 30	.....	39_8	32 32.0	117 17.0	130	
611	P.D.	June 30	.....	39_8	32 32.0	117 17.0	130	
612	.....	June 30	9:30–? a.m.	B	32 40.6	117 10.5	0	
613	000	July 1	.....	40_7	32 36.0	117 21.6	0	
614	P.F.	July 1	.....	40_7	32 36.0	117 21.6	0	
615	P.F.	July 1	.....	40_7	32 36.0	117 21.6	55	
616	P.12	July 1	.....	40_7	32 36.0	117 21.6	130	
617	P.F.	July 1	.....	40_7	32 36.0	117 21.6	130	
618	000	July 1	.....	40_7	32 36 0	117 21.6	130–0	
619	000	July 1	.....	40_7	32 36.0	117 21.6	0	
620	P.D.	July 2	.....	41_8	32 38.0	117 23.0	0	
621	P.12	July 2	.....	41_8	32 38.0	117 23.0	73	
622	P.D.	July 2	.....	41_8	32 38.0	117 23.0	73	
623	P.F.	July 2	.....	41_8	32 38.0	117 23.0	130	
624	P.12	July 2	.....	41_8	32 38.0	117 23.0	130	
625	000	July 2	.....	41_8	32 38.0	117 23.0	130–0	
626	12	July 2	.....	41_8	32 38.0	117 23.0	130–0	
627	P.12	July 3	.....	.....	.....	.....	73	On San Diego
628	000	July 3	.....	.....	.....	.....	0	Off San Diego
629	12	July 3	.....	.....	.....	.....	130–0	Off San Diego
630	P.12	July 3	.....	.....	.....	.....	130	Off San Diego
631	P.D.	July 3	.....	.....	.....	.....	130	Off San Diego
632	.....	July 3	9:00–? p.m.	B	32 40.6	117 10.5	0	
633	000	July 3	.....	.....	.....	.....	185–0	Off San Diego
634	P.D.	July 6	.....	.....	.....	.....	0	Off San Diego
635	12	July 6	.....	.....	.....	.....	0	Off San Diego
636	000	July 6	.....	.....	.....	.....	0	Off San Diego
637	P.12	July 6	.....	.....	.....	.....	73	Off San Diego
638	P.12	July 6	.....	.....	.....	.....	130	Off San Diego
639	P.D.	July 6	.....	.....	.....	.....	73	Off San Diego
640	12	July 6	.....	.....	.....	.....	130–0	Off San Diego
641	000	July 6	.....	.....	.....	.....	155–0	Off San Diego

* No data relative to hauls 587–589.

Table 5.—Data Relative to Plankton Hauls—(*Continued*)

Part A—Preliminary Plankton Collections

Haul number	Apparatus used	Date 1903	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Remarks
642	P.D.	July 6					130	Off San Diego
643	000	July 7					0	Off San Diego
644	12	July 7		B	32 40.6	117 10.5	0	
645	12	July 7					0	Off San Diego
646	P.D.	July 7					0	Off San Diego
647	P.D.	July 7					73	Off San Diego
648	P.12	July 7					73	Off San Diego
649	P.D.	July 7					130	Off San Diego
650	P.12	July 7					130	Off San Diego
651	12	July 7					130–0	Off San Diego
652	000	July 7					130–0	Off San Diego
653	P.F.	July 8	Night				0	Off San Diego
654	P.F.	July 8	Night				0	Off San Diego
655	000	July 8	Night				0	Off San Diego
656	P.F.	July 8	Night				73	Off San Diego
657	P.12	July 8	Night				73	Off San Diego
658	P.D.	July 8	Night				0	Off San Diego
659	12	July 8	Night				0	Off San Diego
660	P.D.	July 8	Night				73	Off San Diego
661	P.D.	July 8	Night				130	Off San Diego
662	P.F.	July 8	Night				130	Off San Diego
663	P.F.	July 8	Night				130	Off San Diego
664	P.12	July 8	Night				130	Off San Diego
665	12	July 8	Night				165–0	Off San Diego
666	000	July 8	Night				165–0	Off San Diego
667	.....	July 8	Night				165–0	Off San Diego
668	12	July 8	Night				165–0	Off San Diego
669	12	July 8		B	32 40.6	117 10.5	0	
670	P.12	July 9					73	Off San Diego
671	12	July 9					0	Off San Diego
672	P.F.	July 9					73	Off San Diego
673	P.12	July 9					130	Off San Diego
674	P.F.	July 9					130	Off San Diego
675	000	July 9					155–0	Off San Diego
676	12	July 9					155–0	Off San Diego
677	P.F.	July 10					0	Off San Diego
678	000	July 10					0	Off San Diego
679	12	July 10					0	Off San Diego
680	P.12	July 10					73	Off San Diego
681	P.F.	July 10					73	Off San Diego
682	P.12	July 10					130	Off San Diego
683	P.F.	July 10					130	Off San Diego
686	12	July 10					165–0	Off San Diego
688	000	July 10					165–0	Off San Diego
689	P.F.	July 13					0	Off San Diego
690	P.F.	July 13					73	Off San Diego
691	P.12	July 13					73	Off San Diego
692	P.12	July 13					130	Off San Diego
693	P.F.	July 13					130	Off San Diego
694	000	July 13					140–0	Off San Diego
695	12	July 13					140–0	Off San Diego
696	12	July 14					0	Off San Diego
697	P.F.	July 14					0	Off San Diego
698	P.12	July 14					73	Off San Diego
699	P.F.	July 14					73	Off San Diego
700	P.12	July 14					130	Off San Diego
701	P.F.	July 14					130	Off San Diego
702	000	July 14					175–0	Off San Diego
703	12	July 14					175–0	Off San Diego
704	000	July 16					0	Off San Diego
705	12	July 16					0	Off San Diego
706	P.F.	July 16					0	Off San Diego
707	P.F.	July 16					73	Off San Diego

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part A—Preliminary Plankton Collections

Haul number	Apparatus used	Date 1903	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Remarks
708	P.12	July 16					73	Off San Diego
709	P.F.	July 16					130	Off San Diego
710	P.12	July 16					130	Off San Diego
711	000	July 16					185–0	Off San Diego
712	12	July 16					185–0	Off San Diego
713	000	July 17					120–0	Off San Diego
714	12	July 17					120–0	Off San Diego
715	12	July 18					92–0	Off San Diego
716	12	July 21		39_7	32° 37.0	117° 15.0	0	
717	000	July 21		39_7	32 37.0	117 15.0	0	
718	12	July 21		39_7	32 37.0	117 15.0	0	
719	000	July 21		39_7	32 37.0	117 15.0	0	
720	000	July 21		B	32 41.4	117 10.0	0	
721	12	July 21		B	32 41.4	117 10.0	0	
723	12	July 21					46–0	Off San Diego
724	12	July 21					82–0	Off San Diego
725	12	July 21					92–0	Off San Diego
726	12	July 21					120–0	Off San Diego
727	000	July 21					155–0	Off San Diego
728	000	July 21					155–0	Off San Diego
729	12	July 22					100 0	Off San Diego
730	20	July 22	Night	(39_8)	32 38.0	117 15.0	0	
731	12	July 22		39_7	32 37.0	117 15.0	0	
732	P.F.	July 22					0	Off San Diego
733	12	July 22					64–0	Off San Diego
735	P.F.	July 22					73	Off San Diego
736	12	July 22					135–0	Off San Diego
737	000	July 22					175–0	Off San Diego
738	000	July 22					175–0	Off San Diego
739	P.F.	July 22					130	Off San Diego
740	20	July 23					250–0	Off San Diego
741	000	July 23					310–0	Off San Diego
742	12	July 23					92–0	Off San Diego
743	12	July 23		B	32 41.4	117 10.0	0	
744	12	July 23					130–0	Off San Diego
745	20	July 23					165–0	Off San Diego
746	20	July 23					210–0	Off San Diego
747	20	July 23					240–0	Off San Diego
748	12	July 23					200–0	Off San Diego
749	12	July 23					175–0	Off San Diego
750	20	July 23					275–0	Off San Diego
751	.....	July 25					0	In San Diego Bay
752	12	July 27					225–0	Off San Diego
753	20	July 27					300–0	Off San Diego
754	20	July 27					290–0	Off San Diego
755	20	July 27					285–0	Off San Diego
756	20	July 27					260–0	Off San Diego
757	20	July 27					255–0	Off San Diego
758	20	July 27					225–0	Off San Diego
759	12	July 27					170–0	Off San Diego
760	12	July 27					215–0	Off San Diego
761	20	July 27					0	Off Coronado
762	20	July 28					155–0	Off San Diego
763	20	July 28					110–0	Off San Diego
764	12	July 28					73–0	Off San Diego
765	20	July 29					155–0	Off San Diego
766	20	July 29					185–0	Off San Diego
767	12	July 29					120–0	Off San Diego
768	12	July 29					110–0	Off San Diego
769	000	July 29					82–0	Off San Diego
770	000	July 29					55–0	Off San Diego
771	20	July 29					0	Off San Diego
772	20	July 29					195–0	Off San Diego

Table 5.—Data Relative to Plankton Hauls—(*Continued*)

Part A—Preliminary Plankton Collections

Haul number	Apparatus used	Date 1903	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Remarks
773	20	July 29					145–0	Off San Diego
774	P.20	July 31					130	Off San Diego
775	000	July 31					185–0	Off San Diego
776	12	July 31					110–0	Off San Diego
777	20	July 31					145–0	Off San Diego
778	P.20	July 31					77	Off San Diego
779	P.20	July 31					51	Off San Diego
780	P.20	July 31					105	Off San Diego
781	P.20	July 31					22	Off San Diego
782	12	Nov. 1					145–0	Off San Diego
783	000	Nov. 1					200–0	Off San Diego
784	20	Nov. 1					175–0	Off San Diego
785	000	Nov. 1					210–0	Off San Diego
786	20	Nov. 1					120–0	Off San Diego
787	000	Dec. 17		41_7	32° 33′	117° 23′	145–0	
788	20	Dec. 17		41_7	32 33	117 23	165–0	
789	20	Dec. 17		41_7	32 33	117 23	110–0	
790	12	Dec. 17		41_7	32 33	117 23	72–0	
791	000	Dec. 17		41_7	32 33	117 23	200–0	
792	20	Dec. 17		B	32 40.6	117 10.5	0	
793	12	Dec. 17		41_7	32 33	117 23	130–0	
794	20	Dec. 18		41_7	32 33	117 23	130–0	
795	12	Dec. 18					92–0	Off San Diego
796	.....	Dec. 18		B	32 40.5	117 10.0	0	Outer channel of Glorietta Bight
797	.....	Dec. 18		B	32 40.5	117 10.0	0	Inner channel of Glorietta Bight
798	000	Dec. 18		41_7	32 33	117 23	145–0	
799	20	Dec. 18		41_7	32 33	117 23	92–0	
800	000	Dec. 18		41_7	32 33	117 23	165–0	
801	12	Dec. 18		41_7	32 33	117 23	36–0	
802	12	Dec. 21		41_7	32 33	117 23	73–0	
803	000	Dec. 21		41_7	32 33	117 23	145–0	
804	20	Dec. 21		41_7	32 33	117 23	130–0	
805	20	Dec. 21		41_7	32 33	117 23	110–0	
806	12	Dec. 21		41_7	32 33	117 23	92–0	
807	.....	Dec. 22	5:00–? a.m.	B	32 42.0	117 14.0	0	
808	.....	Dec. 22	5:30–? a.m.	B	32 41.6	117 14.1	0	
809	.....	Dec. 22	4:00–? a.m.	B	32 42.2	117 14.0	0	
810	.....	Dec. 22	6:00–? a.m.	B	32 41.0	117 14.0	0	
811	000	Dec. 23		41_7	32 33	117 23	330–0	
812	12	Dec. 23		41_7	32 33	117 23	185–0	
813	20	Dec. 23		41_7	32 33	117 23	220–0	
814	20	Dec. 23		41_7	32 33	117 23	275–0	
815	000	Dec. 23		41_7	32 33	117 23	255–0	
816	20	Dec. 23		41_7	32 33	117 23	220–0	
817	20	Dec. 24		41_7	32 33	117 23	200–0	
818	20	Dec. 24		41_7	32 33	117 23	235–0	
819	000	Dec. 24		41_7	32 33	117 23	295–0	
820	20	Dec. 24		41_7	32 33	117 23	200–0	
821	000	Dec. 24		41_7	32 33	117 23	320–0	
822	12	Dec. 24		41_7	32 33	117 23	185–0	
823	20	Dec. 28		41_7	32 33	117 23	210 0	
824	12	Dec. 28		41_7	32 33	117 23	130 0	
825	000	Dec. 28	2:00–? a.m.	41_7	32 33	117 23	0	
826	000	Dec. 28		41_7	32 33	117 23	300 0	
827	20	Dec. 28		41_7	32 33	117 23	185–0	
828	.....	Dec. 28	8:30–? p.m.	B	32 40.6	117 10.5	0	
829	12	Dec. 28		41_7	32 33	117 23	140–0	
830	20	Dec. 28	2:00–? a.m.	41_7	32 33	117 23	0	
831	000	Dec. 29		41_7	32 33	117 23	73–0	
832	000	Dec. 29		41_7	32 33	117 23	310 0	
833	12	Dec. 29		41_7	32 33	117 23	230–0	
834	20	Dec. 29	2:00–? a.m.	41_7	32 33	117 23	0	

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part A—Preliminary Plankton Collections

Haul number	Apparatus used	Date	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Remarks
		1903						
835	....	Dec. 29	1:00–? p.m.	B	32° 40.6	117° 10.5	0	
836	20	Dec. 29	.....	41_7	32 33	117 23	300–0	
837	12	Dec. 29	.....	41_7	32 33	117 23	195–0	
838	000	Dec. 29	2:00–? a.m.	41_7	32 33	117 23	0	
839	20	Dec. 29	.....	41_7	32 33	117 23	245–0	
840	20	Dec. 30	.....	41_7	32 33	117 23	210–0	
841	000	Dec. 30	.....	41_7	32 33	117 23	275–0	
842	12	Dec. 30	.....	41_7	32 33	117 23	155–0	
843	20	Dec. 30	.....	41_7	32 33	117 23	145–0	
844	20	Dec. 30	.....	41_7	32 33	117 23	0	
845	000	Dec. 30	.....	41_7	32 33	117 23	0	
846	000	Dec. 30	.....	41_7	32 33	117 23	220 0	
847	000	Dec. 30	.....	41_7	32 33	117 23	0	
848	20	Dec. 30	.....	41_7	32 33	117 23	265–0	
849	12	Dec. 30	.....	41_7	32 33	117 23	185 0	
850	12	Dec. 31	.....	41_7	32 33	117 23	92–0	
851	000	Dec. 31	.....	41_7	32 33	117 23	0	
852	20	Dec. 31	.....	41_7	32 33	117 23	0	
853	12	Dec. 31	.....	41_7	32 33	117 23	100–0	
854	20	Dec. 31	.....	41_7	32 33	117 23	145 0	
855	000	Dec. 31	.....	41_7	32 33	117 23	155–0	
856	000	Dec. 31	.....	41_7	32 33	117 23	145–0	
		1904						
857	000	Jan. 4	.....	41_7	32 33	117 23	0	
858	12	Jan. 4	.....	41_7	32 33	117 23	100–0	
859	000	Jan. 4	.....	41_7	32 33	117 23	145–0	
860	20	Jan. 4	.....	41_7	32 33	117 23	0	
861	000	Jan. 4	.....	41_7	32 33	117 23	165–0	
862	20	Jan. 4	.....	41_7	32 33	117 23	155–0	
863	12	Jan. 4	.....	41_7	32 33	117 23	92–0	
864	20	Jan. 4	.....	41_7	32 33	117 23	140–0	
865	000	Jan. 5	.....	.....	.....	.....	185–0	Near Point Loma
866	20	Jan. 5	.....	.....	.....	.....	82–0	Near Point Loma
867	000	Jan. 5	.....	.....	.....	.....	185–0	Near Point Loma
868	20	Jan. 5	.....	.....	.....	.....	11 0	Near Point Loma
		1905						
880	000	June 19	.....	40_5	32 45.5	117 20.7	0	Hauls 880–885
881	12	June 19	.....	40_5	32 45.5	117 20.7	0	made between
882	20	June 19	.....	40_5	32 45.5	117 20.7	0	6:00 and 9:00
883	000	June 19	.....	40_5	32 46.3	117 21.3	0	a.m.
884	12	June 19	.....	40_5	32 46.3	117 21.3	0	
885	20	June 19	.....	40_5	32 46.3	117 21.3	0	
886	000	June 21	.....	(39_{10})	32 52.2	117 17.3	0	Hauls 886–888
887	12	June 21	.....	(39_{10})	32 52.2	117 17.3	0	made between
888	20	June 21	.....	(39_{10})	32 52.2	117 17.3	0	6:00 and 9:00 a.m.
892	000	June 22	.....	(39_{10})	32 51.6	117 17.2	0	Hauls 892–900
893	12	June 22	.....	(39_{10})	32 51.6	117 17.2	0	made between
894	20	June 22	.....	(39_{10})	32 51.6	117 17.2	0	6:00 and 9:00
896	000	June 22	.....	40_{11}	32 55.6	117 19.5	185–0	a.m.
897	12	June 22	.....	40_{11}	32 55.6	117 19.5	175 0	
898	20	June 22	.....	40_{11}	32 55.6	117 19.5	145–0	
900	K.B.	June 22	.....	40_{11}	32 55.6	117 19.5	50	
902	000	June 23	.....	(39_{10})	32 51.6	117 16.5	0	Hauls 902–907
903	12	June 23	.....	(39_{10})	32 51.6	117 16.5	0	made between
904	20	June 23	.....	(39_{10})	32 51.6	117 16.5	0	6:00 and 9:00
906a	K.B.	June 23	.....	40_{11}	32 52.8	117 18.0	0	a.m.
906b	K.B.	June 23	.....	40_{11}	32 52.8	117 18.0	9	Hauls 906a–906h
906c	K.B.	June 23	.....	40_{11}	32 52.8	117 18.0	18	preserved in
906d	K.B.	June 23	.....	40_{11}	32 52.8	117 18.0	27	formalin and
906e	K.B.	June 23	.....	40_{11}	32 52.8	117 18.0	46	$HgCl_2$ and
906f	K.B.	June 23	.....	40_{11}	32 52.8	117 18.0	92	decanted
906g	K.B.	June 23	.....	40_{11}	32 52.8	117 18.0	135	

Table 5.—Data Relative to Plankton Hauls—(*Continued*)
Part A—Preliminary Plankton Collections

Haul number	Apparatus used	Date 1903	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Remarks
906h	K.B.	June 23	.....	40_{11}	32° 52′8	117° 18′0	185	
907a	K.B.	June 23	.....	40_{11}	32 52.8	117 18.0	0	Hauls 907a–907h
907b	K.B.	June 23	.....	40_{11}	32 52.8	117 18.0	9	were filtered
907c	K.B.	June 23	.....	40_{11}	32 52.8	117 18.0	18	directly through
907d	K.B.	June 23	.....	40_{11}	32 52.8	117 18.0	27	No. 20 netting
907e	K.B.	June 23	.....	40_{11}	32 52.8	117 18.0	46	
907f	K.B.	June 23	.....	40_{11}	32 52.8	117 18.0	92	
907g	K.B.	June 23	.....	40_{11}	32 52.8	117 18.0	135	
907h	K.B.	June 23	.....	40_{11}	32 52.8	117 18.0	185	
908	000	June 26	10:00–10:20 a.m.	$(40)_{10}$	32 48.7	117 21.5	0	
909	12	June 26	10:00–10:20 a.m.	$(40)_{10}$	32 48.7	117 21.5	0	
910	20	June 26	10:00–10:20 a.m.	$(40)_{10}$	32 48.7	117 21.5	0	
911	000	June 26	.....	$(40)_{10}$	32 48.7	117 21.5	0	Hauls 911–916
912	12	June 26	.....	$(40)_{10}$	32 48.7	117 21.5	92–0	made between
913	20	June 26	.....	$(40)_{10}$	32 48.7	117 21.5	120 0	10:20 a.m. and
914	000	June 26	.....	$(40)_{10}$	32 48.7	117 21.5	0	noon
915	12	June 26	.....	$(40)_{10}$	32 48.7	117 21.5	0	
916	20	June 26	.....	$(40)_{10}$	32 48.7	117 21.5	0	
917	000	June 27	6:00–6:20 a.m.	$(40)_{10}$	32 52.4	117 18.3	0	Hauls 917–921g
918	12	June 27	6:00–6:20 a.m.	$(40)_{10}$	32 52.4	117 18.3	0	made between
919	20	June 27	6:00–6:20 a.m.	$(40)_{10}$	32 52.4	117 18.3	0	6:00 and 10:00
920a	K.B.	June 27	.....	40_{11}	32 54.8	117 20.3	0	a.m.
920b	K.B.	June 27	.....	40_{11}	32 54.8	117 20.3	18	Hauls 920a–920g
920c	K.B.	June 27	.....	40_{11}	32 54.8	117 20.3	46	were filtered
920d	K.B.	June 27	.....	40_{11}	32 54.8	117 20.3	92	directly through
920e	K.B.	June 27	.....	40_{11}	32 54.8	117 20.3	185	No. 20 netting
920f	K.B.	June 27	.....	40_{11}	32 54.8	117 20.3	275	
920g	K.B.	June 27	.....	40_{11}	32 54.8	117 20.3	365	
921a	K.B.	June 27	.....	40_{11}	32 54.8	117 20.3	0	Hauls 921a–921g
921b	K.B.	June 27	.....	40_{11}	32 54.8	117 20.3	18	preserved in
921c	K.B.	June 27	.....	40_{11}	32 54.8	117 20.3	46	formalin and
921d	K.B.	June 27	.....	40_{11}	32 54.8	117 20.3	92	$HgCl_2$ and
921e	K.B.	June 27	.....	40_{11}	32 54.8	117 20.3	185	decanted
921f	K.B.	June 27	.....	40_{11}	32 54.8	117 20.3	275	
921g	K.B.	June 27	.....	40_{11}	32 54.8	117 20.3	365	
922	000	June 28	5:30–5:50 a.m.	40_{11}	32 53.8	117 19.2	0	
923	12	June 28	5:30–5:50 a.m.	40_{11}	32 53.8	117 19.2	0	
924	20	June 28	5:30–5:50 a.m.	40_{11}	32 53.8	117 19.2	0	
925	000	June 28	6:00 a.m.	40_{11}	32 53.8	117 19.2	185 0	
926	12	June 28	6:00 a.m.	40_{11}	32 53.8	117 19.2	145–0	
927	20	June 28	6:00 a.m.	40_{11}	32 53.8	117 19.2	175–0	
928	000	June 28	4:00 p.m.	40_{11}	32 53.8	117 18.3	185 0	
929	12	June 28	4:00 p.m.	40_{11}	32 53.8	117 18.3	145–0	
930	20	June 28	4:00 p.m.	40_{11}	32 53.8	117 18.3	175–0	
932	000	June 29	6:50–? a.m.	40_{11}	32 54.2	117 21.0	0	Hauls 932–934
933	12	June 29	6:50–? a.m.	40_{11}	From 5:50 to 7:07		0	ended before
934	20	June 29	6:50–? a.m.	40_{11}	a.m. boat drifted		0	7:07 a.m.
935	000	June 29	5:50 a.m.	40_{11}	from above posi-		185–0	
936	12	June 29	5:50 a.m.	40_{11}	tion to follow-		145–0	
937	20	June 29	5:50 a.m.	40_{11}	ing position		175–0	
938	12	June 29	7:07 a.m.	40_{11}	32 53.3	117 19.7	92–0	
939	000	June 30	4:55 a.m.	40_{11}	32 53.4	117 18.8	185–0	
940	12	June 30	4:55 a.m.	40_{11}	From 4:55 to 5:55		145–0	
941	20	June 30	4:55 a.m.	40_{11}	a.m. boat drifted		175–0	
942	000	June 30	5:25–5:45 a.m.	40_{11}	from above posi-		0	
943	12	June 30	5:25–5:45 a.m.	40_{11}	tion to follow-		0	
944	20	June 30	5:25–5:45 a.m.	40_{11}	ing position		0	
945	12	June 30	5:55 a.m.	40_{11}	32 52.9	117 17.6	92–0	
946a	K.B.	June 30	11:25 a.m.	40_{11}	32 54.8	117 20.3	365	
946b	K.B.	June 30	.....	40_{11}	32 54.8	117 20.3	275	
946c	K.B.	June 30	.....	40_{11}	32 54.8	117 20.3	405	Hauls 946b–946c
946d	K.B.	June 30	2:45 p.m.	40_{11}	32 54.8	117 20.3	310	made between
947*	000	July 1	6:30–6:50 a.m.	(39.5_{11})	32 53.6	117 18.0	0	11:25 a.m. and
948*	12	July 1	6:30–6:50 a.m.	(39.5_{11})	32 53.6	117 18.0	0	2:45 p.m.

* From 6:00 to 6:55 a.m. the boat drifted from the position entered to 32° 52′8 N 117° 17′3 W.

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part A—Preliminary Plankton Collections

Haul number	Apparatus used	Date 1903	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Remarks
949*	20	July 1	6:30–6:50 a.m.	(39.5_{11})	32° 53.6	117° 18.0	0	
950*	000	July 1	6:00 a.m.	40_{11}	32 53.6	117 18.0	185–0	
951*	12	July 1	6:00 a.m.	40_{11}	32 53.6	117 18.0	145–0	
952*	20	July 1	6:00 a.m.	40_{11}	32 53.6	117 18.0	175–0	
953	000	July 1	6:55 a.m.	(39_{11})	32 52.8	117 17.3	100–0	
954	12	July 1	6:55 a.m.	(39_{11})	32 52.8	117 17.3	64–0	
955	20	July 1	6:55 a.m.	(39_{11})	32 52.8	117 17.3	92–0	
957	20	July 3	8:30–? a.m.	(39_{10})	32 51.4	117 16.5	0	
959	000	July 5	1:20–1:40 p.m.	41_{11}	32 57.1	117 25.9	0	
960	12	July 5	1:20–1:40 p.m.	41_{11}	32 57.1	117 25.9	0	
961	20	July 5	1:20–1:40 p.m.	41_{11}	32 57.1	117 25.9	0	
962	000	July 5	1:05 p.m.	41_{11}	32 57.1	117 25.9	215–0	
963	12	July 5	1:05 p.m.	41_{11}	32 57.1	117 25.9	180–0	
964	20	July 5	1:05 p.m.	41_{11}	32 57.1	117 25.9	205–0	
965a	K.B.	July 5	9:04 a.m.	41_{11}	32 56.0	117 26.1	365	
965b	K.B.	July 5	9:25 a.m.	41_{11}	32 56.0	117 26.1	275	
966	000	July 6	.....	(39_{10})	32 52.2	117 17.0	0	Hauls 966–968
967	12	July 6	.....	(39_{10})	32 52.2	117 17.0	0	probably lasted
968	20	July 6	.....	(39_{10})	32 52.2	117 17.0	0	40 minutes
969	000	July 7	5:45–6:25 a.m.	$(40)_{10}$	32 52.4	117 18.3	0	
970	12	July 7	5:45–6:25 a.m.	$(40)_{10}$	32 52.4	117 18.3	0	
971	20	July 7	5:45–6:25 a.m.	$(40)_{10}$	32 52.4	117 18.3	0	
976	000	July 8	6:00–6:20 a.m.	40_{11}	32 52.7	117 18.0	0	
977	12	July 8	6:00–6:20 a.m.	40_{11}	32 52.7	117 18.0	0	
978	20	July 8	6:00–6:20 a.m.	40_{11}	32 52.7	117 18.0	0	
979	000	July 8	.....	40_{11}	32 52.7	117 18.0	185–0	Hauls 979–981
980	12	July 8	.....	40_{11}	32 52.7	117 18.0	145–0	probably between
981	20	July 8	.....	40_{11}	32 52.7	117 18.0	175–0	7:00 and 8:00 a.m
982a	K.B.	July 8	.....	40_{11}	32 55.0	117 18.0	9	Hauls 982a–982g
982b	K.B.	July 8	.....	40_{11}	32 55.0	117 18.0	18	probably between
982c	K.B.	July 8	.....	40_{11}	32 55.0	117 18.0	46	9:00 and 10:00
982d	K.B.	July 8	.....	40_{11}	32 55.0	117 18.0	92	a.m.
982e	K.B.	July 8	.....	40_{11}	32 55.0	117 18.0	185	
982f	K.B.	July 8	.....	40_{11}	32 55.0	117 18.0	275	
982g	K.B.	July 8	.....	40_{11}	32 55.0	117 18.0	365	
983	000	July 10	7:15–7:35 a.m.	40_{11}	32 53.0	117 19.3	0	
984	12	July 10	7:15–7:35 a.m.	40_{11}	32 53.0	117 19.3	0	
985	20	July 10	7:15–7:35 a.m.	40_{11}	32 53.0	117 19.3	0	
986	000	July 10	6:20 a.m.	40_{11}	32 53.0	117 19.3	185–0	Hauls 986–988
987	12	July 10	6:20 a.m.	40_{11}	32 53.0	117 19.3	145–0	duplicated at
988	20	July 10	6:20 a.m.	40_{11}	32 53.0	117 19.3	175–0	7:00 a.m. and
992	000	July 11	7:00–7:20 a.m.	(39_{11})	32 52.8	117 17.2	0	catches com-
993	12	July 11	7:00–7:20 a.m.	(39_{11})	32 52.8	117 17.2	0	bined
994	20	July 11	7:00–7:20 a.m.	(39_{11})	32 52.8	117 17.2	0	
995	000	July 11	6:05 a.m.	(39_{11})	32 52.8	117 17.2	185–0	
996	12	July 11	6:05 a.m.	(39_{11})	32 52.8	117 17.2	145–0	
997	20	July 11	6:05 a.m.	(39_{11})	32 52.8	117 17.2	175–0	
999	000	July 11	6:10–6:30 p.m.	$(40)_{10}$	32 52.4	117 18.3	0	
1000	12	July 11	6:10–6:30 p.m.	$(40)_{10}$	32 52.4	117 18.3	0	
1001	20	July 11	6:10–6:30 p.m.	$(40)_{10}$	32 52.4	117 18.3	0	
1002	000	July 12	7:30–7:50 a.m.	40_{11}	32 54.8	117 20.3	0	
1003	12	July 12	7:30–7:50 a.m.	40_{11}	32 54.8	117 20.3	0	
1004	20	July 12	7:30–7:50 a.m.	40_{11}	32 54.8	117 20.3	0	
1005	000	July 12	7:00 a.m.	40_{11}	32 54.8	117 20.3	365–0	
1006	12	July 12	7:00 a.m.	40_{11}	32 54.8	117 20.3	365–0	
1007	20	July 12	7:00 a.m.	40_{11}	32 54.8	117 20.3	365–0	
1008	.....	July 12	.....	(39_{10})	.....	.....	0	Dip-net haul, two
1010	000	July 13	9:00–9:20 a.m.	40_{11}	32 53.3	117 19.6	0	miles off
1011	12	July 13	9:00–9:20 a.m.	40_{11}	32 53.3	117 19.6	0	La Jolla
1012	20	July 13	9:00–9:20 a.m.	40_{11}	32 53.3	117 19.6	0	
1013	000	July 13	8:00 a.m.	40_{11}	32 53.3	117 19.6	275–0	
1014	12	July 13	8:00 a.m.	40_{11}	32 53.3	117 19.6	275–0	
1015	20	July 13	8:00 a.m.	40_{11}	32 53.3	117 19.6	275–0	

* From 6:00 to 6:55 a.m. the boat drifted from the position entered to 32° 52.8 N 117° 17.3 W.

Table 5.—Data Relative to Plankton Hauls—(*Continued*)

Part A—Preliminary Plankton Collections

Haul number	Apparatus used	Date 1903	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Remarks
1016a	K.B.	July 17	1:02 p.m.	43_{11}	32° 53.3	117° 35.3	825	Hauls 1016a–1017e
1016b	K.B.	July 17	1:52 p.m.	43_{11}	32 53.3	117 35.3	460	were filtered
1017a	K.B.	July 17	6:44 p.m.	44_{11}	32 53.8	117 39.6	730	directly through
1017b	K.B.	July 17	7:17 p.m.	44_{11}	32 53.8	117 39.6	550	No. 20 netting
1017c	K.B.	July 17	7:51 p.m.	44_{11}	32 53.8	117 39.6	365	
1018	000	July 17	8:30–8:45 p.m.	44_{11}	32 54.0	117 41.3	0	
1019	12	July 17	8:30–8:45 p.m.	44_{11}	32 54.0	117 41.3	0	
1020a	K.B.	July 18	11:12 a.m.	52_{10}	32 50.0	118 19.0	730	Hauls 1020a–1020e
1020b	K.B.	July 18	12:28 p.m.	52_{10}	32 50.0	118 19.0	185	were filtered
1020c	K.B.	July 18	12:52 p.m.	52_{10}	32 50.0	118 19.0	550	directly through
1020d	K.B.	July 18	1:38 p.m.	52_{10}	32 50.0	118 19.0	365	No. 20 netting
1020e	K.B.	July 18	2:09 p.m.	52_{10}	32 50.0	118 19.0	460	
1021	.....	July 17	.....	.....	.....	.....	0	Dip-net haul, near San Clemente Is.
1024	.....	July 19	....	.....	.....	.....	0	Dip-net haul, near San Clemente Is.
1029a	K.B.	July 20	11:38 a.m.	$51_{11.5}$	32 57.5	118 16.9	915	Hauls 1029a–1029e
1029b	K.B.	July 20	12:21 p.m.	$51_{11.5}$	32 57.5	118 16.9	550	were filtered
1029c	K.B.	July 20	12:50 p.m.	$51_{11.5}$	32 57.5	118 16.9	365	directly through
1029d	K.B.	July 20	1:21 p.m.	$51_{11.5}$	32 57.5	118 16.9	730	No. 20 netting
1029e	K.B.	July 20	1:49 p.m.	$51_{11.5}$	32 57.5	118 16.9	185	
1030	000	July 20	2:30 p.m.	$51_{11.5}$	32 57.5	118 16.9	730–0	
1031	12	July 20	2:30 p.m.	$51_{11.5}$	32 57.5	118 16.9	730–0	
1032	20	July 20	2:30 p.m.	$51_{11.5}$	32 57.5	118 16.9	730–0	
1034a	K.B.	July 21	6:05 a.m.	44_{11}	32 55.6	117 38.1	640	Hauls 1034a–1034e
1034b	K.B.	July 21	6:55 a.m.	44_{11}	32 55.6	117 38.1	365	were filtered
1034e	K.B.	July 21	7:18 a.m.	44_{11}	32 55.6	117 38.1	185	directly through No. 20 netting
1036a	K.B.	July 21	10:54 a.m.	42_{11}	32 55.0	117 31.6	640	Hauls 1036a–1036e
1036b	K.B.	July 21	12:36 p.m.	42_{11}	32 55.0	117 31.6	365	were filtered
1036e	K.B.	July 21	12:49 p.m.	42_{11}	32 55.0	117 31.6	185	directly through
1039	000	July 21	6:30 p.m.	41_{11}	32 53.5	117 24.2	185–0	No. 20 netting
1040	12	July 21	6:30 p.m.	41_{11}	32 53.5	117 24.2	145–0	
1041	20	July 21	6:30 p.m.	41_{11}	32 53.5	117 24.2	175–0	
1042	20	July 26	11:00–11:20 a.m.	(39_{10})	32 51.8	117 16.9	0	
1043	12	July 26	11:00–11:20 a.m.	(39_{10})	32 51.8	117 16.9	18	
1045	000	July 27	4:00 p.m.	41_{12}	32 58.5	117 24.5	550 0	
1046	20	July 27	4:00 p.m.	41_{12}	32 58.5	117 24.5	550–0	
1048	000	July 28	7:15 p.m.	40_{11}	32 52.7	117 18.0	185–0	
1049	12	July 28	7:15 p.m.	40_{11}	32 52.7	117 18.0	145–0	
1050	20	July 28	7:15 p.m.	40_{11}	32 52.7	117 18.0	175 0	
1051	000	July 28	7:30–7:50 p.m.	40_{11}	32 52.7	117 18.0	0	
1052	12	July 28	7:30–7:50 p.m.	40_{11}	32 52.7	117 18.0	0	
1053	20	July 28	7:30–7:50 p.m.	40_{11}	32 52.7	117 18.0	0	
1054	000	July 29	10:00 a.m.	40_{11}	32 55	117 18	365–0	
1055	12	July 29	10:00 a.m.	40_{11}	32 55	117 18	365 0	
1056	20	July 29	10:00 a.m.	40_{11}	32 55	117 18	365–0	
1057	20	Nov. 9	....	(39_{10})	32 51.3	117 16.5	0	Hauls 1057–1059
1058	20	Nov. 10	....	(39_{10})	32 51.3	117 16.5	0	began between
1059	20	Nov. 15	....	(39_{10})	32 51.3	117 16.5	0	7:00 and 9:00 a.m. and lasted 20 minutes
1060	K.B.	Dec. 16	11:20 a.m.	.....	.....	....	870	Hauls 1060–1075
1062	K.B.	Dec. 16	12:50 p.m.	....	....	....	500	made about 20
1063	K.B.	Dec. 16	1:35 p.m.	.....	.....	.. .. ..	320	miles NW of
1064	K.B.	Dec. 17	4:00 a.m.	..	.....	... .	730	San Diego
1065	K.B.	Dec. 17	4:40 a.m.	.....	.....	.....	560	
1066	K.B.	Dec. 17	5:20 a.m.	.....	.....	.....	365	
1067	K.B.	Dec. 17	7:25 a.m.	.....	.....	....	990	
1068	K.B.	Dec. 17	8:30 a.m.	. . ..	....	..... .	900	
1069	K B.	Dec. 17	9:25 a.m.	.....	.....	.....	715	
1070	K.B.	Dec. 17	10:50 a.m.	.....	.....	....	530	
1071	K.B.	Dec. 17	11:40 a.m.	. .....	.....	.....	530	
1073	12	Dec. 17	.....	.....	.....	.....	0	

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part A—Preliminary Plankton Collections

Haul number	Apparatus used	Date	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Remarks
		1903						
1074	20	Dec. 17	.....	.....	.....	.....	0	
1075	000	Dec. 17	.....	.....	.....	.....	0	
1077	.....	Dec. 27	8:00–9:00 a.m.	.....	32° 47.0	117° 14.7	0	High tide. False
1078	.....	Dec. 28	3:00–4:00 p.m.	(39_{10})	32 51.3	117 16.5	0	Bay.
1079	.....	Dec. 30	.....	(39_{10})	32 51.3	117 16.5	0	
		1906						
1080	.....	Jan. 2	.....	(39_{10})	32 51.3	117 16.5	0	Haul made about
1081	.....	Jan. 3	5:00 ? p.m.	(39_{10})	32 51.3	117 16.5	0	10:00 p.m.
1082	.....	Jan. 4	12:01–? p.m.	(39_{10})	32 51.3	117 16.5	0	
1083	.....	Jan. 4	.....	(39_{10})	32 51.3	117 16.5	0	Haul made about
1084	.....	May 18	8:00–? p.m.	(39_{10})	32 51.3	117 16.5	0	10:00 p.m.
1085	.....	May 24	8:00–? p.m.	(39_{10})	32 51.3	117 16.5	0	
1086	.....	June 1	8:00–? p.m.	(39_{10})	32 51.3	117 16.5	0	
1087	000	June 19	5:30 a.m.	40_{11}	32 53.0	117 17.6	92–0	
1088	000	June 19	6:00–? a.m.	40_{11}	32 53.0	117 17.6	0	
1089	20	June 19	6:00–? a.m.	40_{11}	32 53.0	117 17.6	0	
1090	20	June 19	5:30 a.m.	40_{11}	32 53.0	117 17.6	64–0	
1091	20	June 19	5:30 a.m.	40_{11}	32 53.0	117 17.6	82 0	
1094	000	June 19	3:30 p.m.	40_{11}	32 53.0	117 17.6	185–0	
1095	20	June 19	3:30 p.m.	40_{11}	32 53.0	117 17.6	185–0	
1096	000	June 20	4:50–5:10 a.m.	(39_{10})	32 52.0	117 16.5	0	
1097	12	June 20	4:50–5:10 a.m.	(39_{10})	32 52.0	117 16.5	0	
1098	20	June 20	4:50–5:10 a.m.	(39_{10})	32 52.0	117 16.5	0	
1099	000	June 20	5:40 a.m.	(39_{10})	32 52.0	117 16.5	64–0	
1100	12	June 20	5:40 a.m.	(39_{10})	32 52.0	117 16.5	46 0	
1101	20	June 20	5:40 a.m.	(39_{10})	32 52.0	117 16.5	55 0	
1103	000	June 20	2:30 p.m.	40_{11}	32 52.7	117 20.0	185–0	
1104	12	June 20	2:30 p.m.	40_{11}	32 52.7	117 20.0	145–0	
1105	20	June 20	2:30 p.m.	40_{11}	32 52.7	117 20.0	165 0	
1106	000	June 21	4:55–5:20 a.m.	$(40)_{10}$	32 51.0	117 19.0	0	
1107	12	June 21	4:55 5:20 a.m.	$(40)_{10}$	32 51.0	117 19.0	0	
1108	20	June 21	4:55–5:20 a.m.	$(40)_{10}$	32 51.0	117 19.0	0	
1109	000	June 21	6:00–6:10 a.m.	$(40)_{10}$	32 51.0	117 19.0	27	
1110	12	June 21	6:00 6:10 a.m.	$(40)_{10}$	32 51.0	117 19.0	16	
1111	20	June 21	6:00–6:10 a.m.	$(40)_{10}$	32 51.0	117 19.0	18	
1115	000	June 25	6:05 a.m.	(39_{10})	32 52.2	117 16.4	110–0	
1116	20	June 25	5:15–5:40 a.m.	(39_{10})	32 52.2	117 16.4	0	
1117	12	June 25	5:15–5:40 a.m.	(39_{10})	32 52.2	117 16.4	0	
1118	12	June 25	6:05 a.m.	(39_{10})	32 52.2	117 16.4	82–0	
1119	000	June 25	5:15–5:40 a.m.	(39_{10})	32 52.2	117 16.4	0	
1120	20	June 25	6:05 a.m.	(39_{10})	32 52.2	117 16.4	100–0	
1125	000	June 26	4:25–4:55 a.m.	(39_{10})	32 51.8	117 16.7	0	
1126	12	June 26	4:25 4:55 a.m.	(39_{10})	32 51.8	117 16.7	0	
1127	20	June 26	4:25–4:55 a.m.	(39_{10})	32 51.8	117 16.7	0	
1128	000	June 26	5:15 a.m.	(39_{10})	32 51.8	117 16.7	73–0	
1129	12	June 26	5:15 a.m.	(39_{10})	32 51.8	117 16.7	73–0	
1130	20	June 26	5:15 a.m.	(39_{10})	32 51.8	117 16.7	73 0	
1131	000	June 26	10:40 a.m.	41_{11}	32 55.7	117 23.7	500–0	
1132	12	June 26	10:40 a.m.	41_{11}	32 55.7	117 23.7	500–0	
1133	20	June 26	10:40 a.m.	41_{11}	32 55.7	117 23.7	500–0	
1134	000	June 26	12:35 p.m.	41_{11}	32 55.7	117 23.7	520–0	
1135	12	June 26	12:35 p.m.	41_{11}	32 55.7	117 23.7	520–0	
1136	20	June 26	12:35 p.m.	41_{11}	32 55.7	117 23.7	520–0	
1137	000	June 27	4:50–5:10 a.m.	(39_{10})	32 52.2	117 17.0	0	
1138	12	June 27	5:35 a.m.	(39_{10})	32 52.2	117 17.0	110–0	
1139	20	June 27	5:35 a.m.	(39_{10})	32 52.2	117 17.0	110–0	
1140	000	June 27	5:35 a.m.	(39_{10})	32 52.2	117 17.0	110 0	
1141	20	June 27	5:55–6:15 a.m.	(39_{10})	32 52.2	117 17.0	0	
1142	20	June 27	4:50 5:10 a.m.	(39_{10})	32 52.2	117 17.0	0	
1143	12	June 27	4:50–5:10 a.m.	(39_{10})	32 52.2	117 17.0	0	
1144	12	June 27	5:55–6:15 a.m.	(39_{10})	32 52.2	117 17.0	0	
1149	000	June 28	4:55 5:20 a.m.	(39_{11})	32 52.6	117 16.5	0	
1150	12	June 28	4:55–5:20 a.m.	(39_{11})	32 52.6	117 16.5	0	
1151	20	June 28	4:55 5:20 a.m.	(39_{11})	32 52.6	117 16.5	0	

Table 5.—Data Relative to Plankton Hauls—(*Continued*)

Part A—Preliminary Plankton Collections

Haul number	Apparatus used	Date 1906	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Remarks
1152	000	June 28	5:45 a.m.	(39_{11})	32° 52.6	117° 16.5	130–0	
1153	12	June 28	5:45 a.m.	(39_{11})	32 52.6	117 16.5	130–0	
1154	20	June 28	5:45 a.m.	(39_{11})	32 52.6	117 16.5	130–0	
1158	000	June 29	5:05–5:20 a.m.	(39_{16})	32 52.3	117 16.4	0	Hauls 1158–1160
1159	12	June 29	5:05–5:20 a.m.	(39_{16})	32 52.3	117 16.4	0	also include
1160	20	June 29	5:05–5:20 a.m.	(39_{16})	32 52.3	117 16.4	0	similar hauls
1161	000	June 29	5:35 a.m.	(39_{16})	32 52.3	117 16.4	55–0	made from 5:55–
1162	12	June 29	5:35 a.m.	(39_{16})	32 52.3	117 16.4	55–0	6:15 a.m.
1163	20	June 29	5:35 a.m.	(39_{16})	32 52.3	117 16.4	55–0	
1168	000	June 30	6:00–6:25 a.m.	(39_{16})	32 52.4	117 16.5	0	
1169	12	June 30	6:00–6:25 a.m.	(39_{16})	32 52.4	117 16.5	0	
1170	20	June 30	6:00–6:25 a.m.	(39_{16})	32 52.4	117 16.5	0	
1171	000	June 30	6:40 a.m.	(39_{16})	32 52.4	117 16.5	37–0	
1172	12	June 30	6:40 a.m.	(39_{16})	32 52.4	117 16.5	37–0	
1173	20	June 30	6:40 a.m.	(39_{16})	32 52.4	117 16.5	37–0	
1174	000	June 30	10:15 a.m.	40_{11}	32 54	117 18	340–0	
1175	12	June 30	10:15 a.m.	40_{11}	32 54	117 18	340 0	
1176	20	June 30	10:15 a.m.	40_{11}	32 54	117 18	340–0	
1177	000	June 30	11:10 a.m.	40_{11}	32 54	117 18	290–0	
1178	12	June 30	11:10 a.m.	40_{11}	32 54	117 18	290–0	
1179	20	June 30	11:10 a.m.	40_{11}	32 54	117 18	290–0	
1180	000	July 2	6:00–6:20 a.m.	(39_{11})	32 52.8	117 16.8	0	
1181	12	July 2	6:00–6:20 a.m.	(39_{11})	32 52.8	117 16.8	0	
1182	20	July 2	6:00–6:20 am..	(39_{11})	32 52.8	117 16.8	0	
1183	000	July 2	6:40 a.m.	(39_{11})	32 52.8	117 16 8	120–0	
1184	12	July 2	6:40 a.m.	(39_{11})	32 52.8	117 16.8	120–0	
1185	20	July 2	6:40 a.m.	(39_{11})	32 52.8	117 16.8	120–0	
1190	000	July 3	5:15–6:05 a.m.	40_{11}	32 53.6	117 18.0	0	
1191	12	July 3	5:15–6:05 a.m.	40_{11}	32 53.6	117 18.0	0	
1192	20	July 3	5:15–6:05 a.m.	40_{11}	32 53.6	117 18.0	0	
1193	000	July 3	6:35 a.m.	40_{11}	32 53.6	117 18.0	155–0	
1194	12	July 3	6:35 a.m.	40_{11}	32 53.6	117 18.0	155 0	
1195	20	July 3	6:35 a.m.	40_{11}	32 53.6	117 18.0	155–0	
1204	000	July 5	6:30–6:55 a.m.	$(39_{16.5})$	32 52.5	117 17.4	0	
1205	12	July 5	6:30–6:55 a.m.	$(39_{16.5})$	32 52.5	117 17.4	0	
1206	20	July 5	6:30–6:55 a.m.	$(39_{16.5})$	32 52.5	117 17.4	0	
1207	000	July 5	7:10 a.m.	$(39_{16.5})$	32 52.5	117 17.4	82–0	
1208	12	July 5	7:10 a.m.	$(39_{16.5})$	32 52.5	117 17.4	82–0	
1209	20	July 5	7:10 a.m.	$(39_{16.5})$	32 52.5	117 17.4	82–0	
1210	000	July 6	6:15–6:45 a.m.	(39_{16})	32 51.8	117 16.5	0	
1211	12	July 6	6:15–6:45 a.m.	(39_{16})	32 51.8	117 16.5	0	
1212	20	July 6	6:15–6:45 a.m.	(39_{16})	32 51.8	117 16.5	0	
1213	000	July 6	7:15 a.m.	(39_{16})	32 51.8	117 16.5	110–0	
1214	12	July 6	7:15 a.m.	(39_{16})	32 51.8	117 16.5	110–0	
1215	20	July 6	7:15 a.m.	(39_{16})	32 51.8	117 16.5	110–0	
1216	12	July 6	9:35–11:35 a.m.	.....	.....	.....	0	Hauls 1216–1237
1217	20	July 6	9:35–11:35 a.m.	.....	.....	.....	0	made within
1218	12	July 6	11:40 a.m.–1:35 p.m.	.....	.....	.....	0	two miles of La Jolla.
1219	20	July 6	11:40 a.m.–1:35 p.m.	.....	.....	.....	0	
1220	12	July 6	1:40–3:35 p.m.	.....	.....	.....	0	
1221	20	July 6	1:40–3:35 p.m.	.....	.....	.....	0	
1222	12	July 6	3:40–5:00 p.m.	.....	.....	.....	0	
1223	20	July 6	3:40–5:00 p.m.	.....	.....	.....	0	
1224	000	July 6	7:00–8:00 p.m.	.....	.....	.....	0	
1225	12	July 6	7:00–8:00 p.m.	.....	.....	.....	0	
1226	20	July 6	7:00–8:00 p.m.	.....	.....	.....	0	
1227	12	July 6	8:05–10:00 p.m.	.....	.....	.....	0	
1228	20	July 6	8:05–10:00 p.m.	.....	.....	.....	0	
1229	12	July 6	10:05–11:59 p.m.	.....	.....	.....	0	
1230	20	July 6	10:05–11:59 p.m.	.....	.....	.....	0	
1231	12	July 7	12:05–2:00 a.m.	.....	.....	.....	0	
1232	20	July 7	12:05–2:00 a.m.	.....	.....	.....	0	

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part A—Preliminary Plankton Collections

Haul number	Apparatus used	Date 1906	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Remarks
1233	12	July 7	2:05–4:00 a.m.	.....	.....	.....	0	
1234	20	July 7	2:05–4:00 a.m.	.....	.....	.....	0	
1235	12	July 7	4:05–6:00 a.m.	.....	.....	.....	0	
1236	20	July 7	4:05–6:00 a.m.	.....	.....	.....	0	
1237	000	July 7	6:05–6:30 a.m.	.....	.....	.....	0	
1240	000	July 10	2:30–2:50 p.m.	$(40)_{10}$	32° 51.6	117° 18.6	0	
1241	12	July 10	2:30–2:50 p.m.	$(40)_{10}$	32 51.6	117 18.6	0	
1242	20	July 10	2:30–2:50 p.m.	$(40)_{10}$	32 51.6	117 18.6	0	
1243	000	July 11	5:35–6:00 a.m.	40_{11}	32 53.0	117 17.6	0	
1244	8	July 11	5:35–6:00 a.m.	40_{11}	32 53.0	117 17.6	0	
1245	20	July 11	5:35–6:00 a.m.	40_{11}	32 53.0	117 17.6	0	
1246	000	July 11	6:20 a.m.	40_{11}	32 53.0	117 17.6	155–0	
1247	8	July 11	6:20 a.m.	40_{11}	32 53.0	117 17.6	155–0	
1248	20	July 11	6:20 a.m.	40_{11}	32 53.0	117 17.6	155–0	
1249	000	July 11	11:10 a.m.–12:10 p.m.	40.5_{11}	32 56.8	117 22.5	595	
1250	8	July 11	11:10 a.m.–12:10 p.m.	40.5_{11}	32 56.8	117 22.5	595	
1251	20	July 11	11:10 a.m.–12:10 p.m.	40.5_{11}	32 56.8	117 22.5	595	
1252	000	July 11	1:30–2:20 p.m.	40.5_{11}	32 56.8	117 22.5	570	
1253	8	July 11	1:30–2:20 p.m.	40.5_{11}	32 56.8	117 22.5	570	
1254	20	July 11	1:30–2:20 p.m.	40.5_{11}	32 56.8	117 22.5	570	
1255	000	July 12	5:10–5:35 a.m.	$(40)_{10}$	32 52.1	117 17.9	0	
1256	8	July 12	5:10–5:35 a.m.	$(40)_{10}$	32 52.1	117 17.9	0	
1257	20	July 12	5:10–5:35 a.m.	$(40)_{10}$	32 52.1	117 17.9	0	
1258	000	July 12	6:00 a.m.	$(40)_{10}$	32 52.1	117 17.9	55–0	
1259	8	July 12	6:00 a.m.	$(40)_{10}$	32 52.1	117 17.9	55–0	
1260	20	July 12	6:00 a.m.	$(40)_{10}$	32 52.1	117 17.9	55–0	
1261	000	July 13	5:55–6:25 a.m.	(39_{10})	32 52.0	117 16.8	0	
1262	8	July 13	5:55–6:25 a.m.	(39_{10})	32 52.0	117 16.8	0	
1263	20	July 13	5:55–6:25 a.m.	(39_{10})	32 52.0	117 16.8	0	
1264	000	July 13	6:45 a.m.	(39_{10})	32 52.0	117 16.8	92–0	
1265	8	July 13	6:45 a.m.	(39_{10})	32 52.0	117 16.8	92–0	
1266	20	July 13	6:45 a.m.	(39_{10})	32 52.0	117 16.8	92–0	
1267	000	July 13	10:20–11:00 a.m.	$(40)_{10}$	32 49.6	117 21.4	185	
1268	8	July 13	10:20–11:00 a.m.	$(40)_{10}$	32 49.6	117 21.4	185	
1269	20	July 13	10:20–11:00 a.m.	$(40)_{10}$	32 49.6	117 21.4	185	
1270	000	July 13	12:10–1:00 p.m.	$(40)_{10}$	32 49.6	117 21.4	285	
1271	8	July 13	12:10–1:00 p.m.	$(40)_{10}$	32 49.6	117 21.4	285	
1272	20	July 13	12:10–1:00 p.m.	$(40)_{10}$	32 49.6	117 21.4	285	
1273	000	July 14	5:30–5:55 a.m.	$(40)_{10}$	32 51.6	117 18.6	0	
1274	8	July 14	5:30–5:55 a.m.	$(40)_{10}$	32 51.6	117 18.6	0	
1275	20	July 14	5:30–5:55 a.m.	$(40)_{10}$	32 51.6	117 18.6	0	
1276	000	July 14	6:20 a.m.	$(40)_{10}$	32 51.6	117 18.6	64–0	
1277	8	July 14	6:20 a.m.	$(40)_{10}$	32 51.6	117 18.6	64–0	
1278	20	July 14	6:20 a.m.	$(40)_{10}$	32 51.6	117 18.6	64–0	
1281	000	July 16	5:30–5:55 a.m.	(39.5_{10})	32 51.6	117 17.5	0	
1282	8	July 16	5:30–5:55 a.m.	(39.5_{10})	32 51.6	117 17.5	0	
1283	20	July 16	5:30–5:55 a.m.	(39.5_{10})	32 51.6	117 17.5	0	
1284	000	July 16	6:15 a.m.	(39.5_{10})	32 51.6	117 17.5	73–0	
1285	8	July 16	6:15 a.m.	(39.5_{10})	32 51.6	117 17.5	73–0	
1286	20	July 16	6:15 a.m.	(39.5_{10})	32 51.6	117 17.5	73–0	
1292	000	July 17	5:40–6:10 a.m.	$(40)_{10}$	32 51.4	117 18.2	0	
1293	8	July 17	5:40–6:10 a.m.	$(40)_{10}$	32 51.4	117 18.2	0	
1294	20	July 17	5:40–6:10 a.m.	$(40)_{10}$	32 51.4	117 18.2	0	
1295	000	July 17	6:30 a.m.	$(40)_{10}$	32 51.4	117 18.2	64–0	
1296	8	July 17	6:30 a.m.	$(40)_{10}$	32 51.4	117 18.2	64–0	
1297	20	July 17	6:30 a.m.	$(40)_{10}$	32 51 4	117 18.2	64–0	
1300	000	July 18	5:40–6:30 a.m.	(39_{10})	32 52.0	117 16.1	0	
1301	8	July 18	5:40–6:30 a.m.	(39_{10})	32 52.0	117 16.1	0	
1302	20	July 18	5:40–6:30 a.m.	(39_{10})	32 52.0	117 16.1	0	
1303	000	July 18	11:40–11:59 a.m.	41_{11}	32 53.0	117 25.6	575	

Table 5.—Data Relative to Plankton Hauls—(*Continued*)

Part A—Preliminary Plankton Collections

Haul number	Apparatus used	Date	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Remarks
		1906						
1304	S	July 18	11:40–11:59 a.m.	41_{11}	32° 53.0	117° 25.6	575	
1305	20	July 18	11:40–11:59 a.m.	41_{11}	32 53.0	117 25.6	575	
1306	000	July 18	12:55–1:15 p.m.	41_{11}	32 53.0	117 25.6	275	
1307	S	July 18	12:55–1:15 p.m.	41_{11}	32 53.0	117 25.6	275	
1308	20	July 18	12:55–1:15 p.m.	41_{11}	32 53.0	117 25.6	275	
1309	000	July 18	1:45–2:10 p.m.	41_{11}	32 53.0	117 25.6	0	
1310	S	July 18	1:45–2:10 p.m.	41_{11}	32 53.0	117 25.6	0	
1311	20	July 18	1:45–2:10 p.m.	41_{11}	32 53.0	117 25.6	0	
1312	000	July 19	5:40–6:30 a.m.	$(39_{10.5})$	32 52.5	117 16.1	0	
1313	S	July 19	5:40–6:30 a.m.	$(39_{10.5})$	32 52.5	117 16.1	0	
1314	20	July 19	5:40–6:30 a.m.	$(39_{10.5})$	32 52.5	117 16.1	0	
1315	000	July 19	12:01–12:20 p.m.	41_{10}	32 49.6	117 26.9	585	
1316	S	July 19	12:01–12:20 p.m.	41_{10}	32 49.6	117 26.9	585	
1317	20	July 19	12:01–12:20 p.m.	41_{10}	32 49.6	117 26.9	585	
1318	000	July 19	1:25–1:55 p.m.	41_{10}	32 49.6	117 26.9	310	
1319	S	July 19	1:25–1:55 p.m.	41_{10}	32 49.6	117 26.9	310	
1320	20	July 19	1:25–1:55 p.m.	41_{10}	32 49.6	117 26.9	310	
1321	000	July 19	2:20–2:45 p.m.	41_{10}	32 49.6	117 26.9	0	
1322	S	July 19	2:20–2:45 p.m.	41_{10}	32 49.6	117 26.9	0	
1323	20	July 19	2:20–2:45 p.m.	41_{10}	32 49.6	117 26.9	0	
1324	000	July 20	5:50–6:15 a.m.	(39_{10})	32 52.4	117 17.0	0	
1325	S	July 20	5:50–6:15 a.m.	(39_{10})	32 52.4	117 17.0	0	
1326	20	July 20	5:50–6:15 a.m.	(39_{10})	32 52.4	117 17.0	0	
1327	000	July 20	6:30 a.m.	(39_{10})	32 52.4	117 17.0	120–0	
1328	S	July 20	6:30 a.m.	(39_{10})	32 52.4	117 17.0	120–0	
1329	20	July 20	6:30 a.m.	(39_{10})	32 52.4	117 17.0	120–0	
1336	000	July 21	5:20–6:20 a.m.	(39_{10})	32 52.0	117 16.2	0	
1337	S	July 21	5:20–6:20 a.m.	(39_{10})	32 52.0	117 16.2	0	
1338	20	July 21	5:20–6:20 a.m.	(39_{10})	32 52.0	117 16.2	0	
1339	000	July 21	11:00 a.m.	41_{11}	32 54.6	117 25.2	565–0	
1340	S	July 21	11:00 a.m.	41_{11}	32 54.6	117 25.2	565–0	
1341	20	July 21	11:00 a.m.	41_{11}	32 54.6	117 25.2	565–0	
1342	000	July 21	12:45 p.m.	41_{11}	32 54.6	117 25.2	275–0	
1343	S	July 21	12:45 p.m.	41_{11}	32 54.6	117 25.2	275–0	
1344	20	July 21	12:45 p.m.	41_{11}	32 54.6	117 25.2	275–0	
1345	000	July 21	1:15–1:40 p.m.	41_{11}	32 54.6	117 25.2	0	
1346	S	July 21	1:15–1:40 p.m.	41_{11}	32 54.6	117 25.2	0	
1347	20	July 21	1:15–1:40 p.m.	41_{11}	32 54.6	117 25.2	0	
1348	000	July 23	5:50–6:30 a.m.	(39_{10})	32 51.9	117 16.9	0	
1349	S	July 23	5:50–6:30 a.m.	(39_{10})	32 51.9	117 16.9	0	
1350	20	July 23	5:50–6:30 a.m.	(39_{10})	32 51.9	117 16.9	0	
1351	000	July 23	10:40 a.m.	40_{11}	32 54.3	117 21.4	390–0	
1352	S	July 23	10:40 a.m.	40_{11}	32 54.3	117 21.4	390–0	
1353	20	July 23	10:40 a.m.	40_{11}	32 54.3	117 21.4	390–0	
1354	000	July 23	11:20 a.m.	40_{11}	32 54.3	117 21.4	210–0	
1355	S	July 23	11:20 a.m.	40_{11}	32 54.3	117 21.4	210–0	
1356	20	July 23	11:20 a.m.	40_{11}	32 54.3	117 21.4	210–0	
1357	000	July 23	11:35–11:59 a.m.	40_{11}	32 54.3	117 21.4	0	
1358	S	July 23	11:35–11:59 a.m.	40_{11}	32 54.3	117 21.4	0	
1359	20	July 23	11:35–11:59 a.m.	40_{11}	32 54.3	117 21.4	0	
1362	000	July 24	5:30–6:25 a.m.	(39_{10})	32 52.2	117 16.6	0	
1363	S	July 24	5:30–6:25 a.m.	(39_{10})	32 52.2	117 16.6	0	
1364	20	July 24	5:30–6:25 a.m.	(39_{10})	32 52.2	117 16.6	0	
1371	000	July 25	5:35–6:30 a.m.	(39_{10})	32 52.4	117 17.0	0	
1372	S	July 25	5:35–6:30 a.m.	(39_{10})	32 52.4	117 17.0	0	
1373	20	July 25	5:35–6:30 a.m.	(39_{10})	32 52.4	117 17.0	0	
1375	20	Aug. 4	5:40 a.m.	40_{11}	32 52.7	117 18.8	145–0	
1376	20	Aug. 4	6:20 a.m.	40_{11}	32 52.7	117 18.8	185–0	
1377	20	Aug. 4	6:40–7:05 a.m.	40_{11}	32 52.7	117 18.8	0	
1378	000	Aug. 4	6:40–7:05 a.m.	40_{11}	32 52.7	117 18.8	0	
		1907						
1379	000	June 3	2:30 p.m.	(39_{11})	32 53.4	117 17.4	135–0	
1380	S	June 3	2:30 p.m.	(39_{11})	32 53.4	117 17.4	130–0	
1381	20	June 3	2:30 p.m.	(39_{11})	32 53.4	117 17.4	120–0	

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part A—Preliminary Plankton Collections

Haul number	Apparatus used	Date	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Remarks
		1907						
1382	000	June 11	7:00 a.m.	(39_{11})	32 53.4	117° 17.4	110–0	
1383	8	June 11	7:00 a.m.	(39_{11})	32 53.4	117 17.4	92–0	
1384	20	June 11	7:00 a.m.	(39_{11})	32 53.4	117 17.4	100–0	
1386	20	June 15	10:00–10:20 a.m.	(39_{10})	32 51.0	117 16.5	0	
1387	000	June 17	7:00 a.m.	40_{11}	32 54.0	117 17.7	145–0	
1388	20	June 17	7:00 a.m.	40_{11}	32 54.0	117 17.7	135–0	
1389	8	June 17	7:00 a.m.	40_{11}	32 54.0	117 17.7	130–0	
1390	20	June 18	6:00–6:20 a.m.	(39_{10})	32 51.3	117 17.2	0	
1391	000	June 21	7:00 a.m.	$(40)_{10}$	32 51.5	117 21.1	92–0	
1392	20	June 21	7:00 a.m.	$(40)_{10}$	32 51.5	117 21.1	82–0	
1393	000	June 24	7:00 a.m.	(39_{11})	32 53.1	117 17.3	110–0	
1394	8	June 24	7:00 a.m.	(39_{11})	32 53.1	117 17.3	92–0	
1395	20	June 24	7:00 a.m.	(39_{11})	32 53.1	117 17.3	100–0	
1396	20	June 28	4:00–4:20 p.m.	(39_{10})	32 51.3	117 17.2	0	
1397	20	July 1	8:00–8:20 a.m.	(39_{10})	32 51.3	117 17.2	0	
1398	000	July 3	10:00 a.m.	(39.5_{11})	32 53.6	117 17.5	135–0	
1399	20	July 3	10:00 a.m.	(39.5_{11})	32 53.6	117 17.5	130–0	
1400	8	July 3	10:00 a.m.	(39.5_{11})	32 53.6	117 17.5	120–0	
1401	20	July 9	9:00 a.m.	40_{11}	32 53.4	117 18.0	130–0	
1402	000	July 9	9:00 a.m.	40_{11}	32 53.4	117 18.0	135–0	
1403	12	July 9	9:00 a.m.	40_{11}	32 53.4	117 18.0	120–0	
1404	20	July 12	9:00 a.m.	$(40)_{10}$	32 50.6	117 22.1	100–0	Surface covered
1405	000	July 12	9:00 a.m.	$(40)_{10}$	32 50.6	117 22.1	110–0	with "red
1406	8	July 12	9:00 a.m.	$(40)_{10}$	32 50.6	117 22.1	92–0	water"
1407	20	July 12	9:00 a.m.	$(40)_{10}$	32 50.6	117 22.1	100–0	
1409	20	July 24	8:00 a.m.	$(40)_{10}$	32 51.5	117 21.9	145–0	
1410	000	July 24	8:00 a.m.	$(40)_{10}$	32 51.5	117 21.9	155–0	
1411	.....	July 24	8:00–? a.m.	$(40)_{10}$	32 51.5	117 21.9	0	
1412	000	July 29	9:30 a.m.	40_{11}	32 53.7	117 18.0	185–0	
1413	20	July 29	9:30 a.m.	40_{11}	32 53.7	117 18.0	175–0	
1414	8	July 29	9:30 a.m.	40_{11}	32 53.7	117 18.0	165–0	
		1908						
1415	20	June 11	2:25–2:45 p.m.	43_{11}	32 56.3	117 34.2	0	
1416	000	June 11	2:25–2:45 p.m.	43_{11}	32 56.3	117 34.2	0	
1417	000	June 12	12:01–12:25 p.m.	43_{10}	32 51.6	117 35.3	0	
1418	000	June 12	10:00–10:25 a.m.	43_{10}	32 51.6	117 35.3	0	
1419	K.B.	June 12	3:15 p.m.	42_9	32 44.7	117 32.3	1020	
		1907						
1420	000	Nov. 2	5:00–5:30 p.m.	39_6	32 32.0	117 16.8	0	
1421	20	Nov. 2	5:00–5:30 p.m.	39_6	32 32.0	117 16.8	0	
1422	12	Nov. 2	5:00–5:30 p.m.	39_6	32 32.0	117 16.8	0	
1423	000	Nov. 3	8:42–9:00 a.m.	(39_5)	32 39.5	117 14.2	0	
1424	20	Nov. 3	8:40–9:00 a.m.	(39_5)	32 39.5	117 14.2	0	
1425	12	Nov. 3	8:35–9:00 a.m.	(39_5)	32 39.5	117 14.2	0	
1426	000	Nov. 3	9:20–9:40 a.m.	(39_5)	32 38.0	117 14.0	0	
1427	20	Nov. 3	9:20–9:40 a.m.	(39_5)	32 38.0	117 14.0	0	
1428	12	Nov. 3	9:20–9:40 a.m.	(39_5)	32 38.0	117 14.0	0	

EXPLANATION OF TABLE 5, PART B

This part includes all the field data relative to the plankton collected since June 12, 1908, which marks the time when water samples were first collected in connection with net hauls and when the first serious attempt at collecting primarily for quantitative purposes was commenced.

First column.—Numbers under which the collections were accessioned; they are arranged in chronological order irrespective of the nature of the haul.

Second column.—Apparatus used in making the hauls: K.B. refers to the Kofoid water bottle (see p. 11), and the remaining symbols to nets as explained in Appendix I.

Third column.—Time and duration of haul entered to the nearest minute.

Fourth column.—Section; for explanation see page 46.

Fifth and sixth columns.—Latitude and longitude; for error see pages 18 and 45.

Seventh column.—Depth at beginning and end of haul entered to the nearest meter above and the nearest five below 200 meters; for error see page 20.

Eighth column.—Numbers indicating water samples taken in connection with haul; see Table 1.

Ninth column.—Miscellaneous remarks relative to hauls.

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position		Depth in meters	Water sample number	Remarks
				N lat.	W long.			
				June 12, 1908				
1429	K.B.	10:30 a.m.	43_{11}	32° 53.7	117° 34.5	915	32	
1430	K.B.	11:14 a.m.	43_{11}	32 53.7	117 34.5	550	33	
				June 13, 1908				
1431	K.B.	9:35 a.m.	(41.5_{14})	33 9.1	117 27.5	300	.....	Imperfectly closed
				June 15, 1908				
1432	000	10:30–10:50 a.m.	42_{8}	32 39.3	117 30.1	0	49, 51	
1433	K.B.	10:35 a.m.	42_{8}	32 39.0	117 30.1	890	50	
1434	K.B.	11:40 a.m.	42_{8}	32 37.7	117 29.9	705	.....	Imperfectly closed
1435	K.B.	12:20 p.m.	42_{7}	32 37.0	117 29.7	455	53	
				June 16, 1908				
1436	000	9:30–9:50 a.m.	43_{10}	32 48.5	117 34.4	0	59	
1437	12	9:30–9:50 a.m.	43_{10}	32 48.5	117 34.4	0	59	
1438	000	11:10–11:50 a.m.	42_{9}	32 46.9	117 31.8	0	60	
1439	12	11:10–11:50 a.m.	42_{9}	32 46.9	117 31.8	0	60	
1440	20	11:10–11:50 a.m.	42_{9}	32 46.9	117 31.8	0	60	
1441	K.B.	11:25 a.m.	42_{9}	32 46.9	117 31.8	890	.....	Imperfectly closed
1442	K.B.	12:01 p.m.	42_{9}	32 46.9	117 31.8	640	61	
				June 17, 1908				
1444	000	12:30–1:00 p.m.	46_{12}	33 0.1	117 50.0	0	.....	
1445	12	12:30–1:00 p.m.	46_{12}	33 0.1	117 50.0	0	.....	
1446	20	12:30–1:00 p.m.	46_{12}	33 0.1	117 50.0	0	.....	
1447	K.B.	12:45 p.m.	46_{12}	33 0.1	117 50.0	705	.....	Imperfectly closed
1448	000	2:40–3:20 p.m.	45_{12}	32 59.5	117 43.6	0	.....	
1449	12	2:40–3:20 p.m.	45_{12}	32 59.5	117 43.6	0	.....	
1450	20	2:40–3:20 p.m.	45_{12}	32 59.5	117 43.6	0	.....	
1451	K.B.	2:40 p.m.	45_{12}	33 0.0	117 42.0	915	67	
1452	000	3:26–3:39 p.m.	44_{12}	33 0.1	117 38.9	0	.....	
1453	12	3:26–3:39 p.m.	44_{12}	33 0.1	117 38.9	0	.....	
1454	20	3:26–3:39 p.m.	44_{12}	33 0.1	117 38.9	0	.....	
				June 18, 1908				
1455	000	10:45–11:20 a.m.	45_{12}	32 57.8	117 46.0	0	.....	
1456	12	10:45–11:20 a.m.	45_{12}	32 57.8	117 46.0	0	.....	
1457	20	10:45–11:20 a.m.	45_{12}	32 57.8	117 46.0	0	.....	
1458	K.B.	11:10 a.m.	45_{12}	32 57.8	117 46.0	1070	.....	Imperfectly closed
1459	K.B.	11:10 a.m.	45_{12}	32 57.8	117 46.0	1070	.....	Same haul as 1458
1460	000	1:40–2:20 p.m.	45_{10}	32 49.8	117 46.0	0	77	
1461	12	1:40–2:20 p.m.	45_{10}	32 49.8	117 46.0	0	77	
1462	20	1:40–2:20 p.m.	45_{10}	32 49.8	117 46.0	0	77	
1463	K.B.	2:20 p.m.	45_{10}	32 49.8	117 46.0	1025	78	
1464	K.B.	2:20 p.m.	45_{10}	32 49.8	117 46.0	1025	78	Same haul as 1463
				June 19, 1908				
1465	000	7:45–8:25 a.m.	41_{12}	32 57.7	117 22.7	0	80	
1466	10	7:45–8:25 a.m.	41_{12}	32 57.7	117 22.7	0	80	
1467	20	7:45–8:25 a.m.	41_{12}	32 57.7	117 22.7	0	80	
1468	000	9:35 a.m.	41_{12}	32 57.7	117 22.7	440–0	.....	
1469	10	9:35 a.m.	41_{12}	32 57.7	117 22.7	440–0	.....	
1470	20	9:35 a.m.	41_{12}	32 57.7	117 22.7	440–0	.....	
1471	000	10:20–10:40 a.m.	(40_{12})	32 58.8	117 20.0	0	81	
1472	10	10:20–10:40 a.m.	(40_{12})	32 58.8	117 20.0	0	81	
1473	20	10:20–10:40 a.m.	(40_{12})	32 58.8	117 20.0	0	81	
				June 21, 1908				
1476*	K.000	.....	42_{10}	32 52	117 30	92	.....	
				June 23, 1908				
1477	K.B.	4:25 p.m.	42_{8}	32 41.4	117 30.3	1100	.....	Mud haul
1478	000	4:45–5:00 p.m.	42_{8}	32 41.4	117 30.3	0	89	
1479	12	4:45–5:00 p.m.	42_{8}	32 41.4	117 30.3	0	89	
1480	20	4:45–5:00 p.m.	42_{8}	32 41.4	117 30.3	0	89	
				June 24, 1908				
1481	K.B.	8:45 a.m.	41_{13}	33 3.7	117 27.0	460	97	
1482	K.B.	9:40 a.m.	42_{13}	33 4.7	117 29.4	520	99	
1483	10	10:05 a.m.	42_{13}	33 5.0	117 29.8	520	.....	
1484	K.B.	11:30 a.m.	42_{11}	33 5.6	117 31.8	660	102	
1485	K.B.	12:50 p.m.	42_{13}	33 4.7	117 29.4	695	.....	

* Trial of Kofoid closing net made between 9:00 and 11:00 a.m.

Table 5.—Data Relative to Planeton Hauls—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				June 25, 1908				
1488	000	8:25–9:15 a.m.	40_{11}	32° 55.0	117° 21.4	0	106	
1489	000	8:25–9:15 a.m.	40_{11}	32 55.0	117 21.4	0	106	Same haul as 1488
1490	0	8:25–9:15 a.m.	40_{11}	32 55.0	117 21.4	0	106	
1491	20	8:25–9:15 a.m.	40_{11}	32 55.0	117 21.4	0	106	
1492	000	10:10 a.m.	40_{11}	32 55.1	117 21.3	385–0	.....	
1493	20	10:10 a.m.	40_{11}	32 55.1	117 21.3	385–0	.....	
1494	000	11:00 a.m.	40_{11}	32 55.1	117 21.3	385–0	.....	
1495	0	11:15 a.m.	40_{11}	32 55.1	117 21.3	185–0	.....	
1496	20	11:15 a.m.	40_{11}	32 55.1	117 21.3	185–0	.....	
1499	000	3:45–4:10 p.m.	$(40)_{10}$	32 51.4	117 21.5	0	.....	
1500	000	3:45–4:10 p.m.	$(40)_{10}$	32 51.4	117 21.5	0	.....	Same haul as 1499
1501	0	3:45–4:10 p.m.	$(40)_{10}$	32 51.4	117 21.5	0	.....	
1502	20	3:45–4:10 p.m.	$(40)_{10}$	32 51.4	117 21.5	0	.....	
				June 26, 1908				
1503	.....	.....	42_{x}	.....	.....	0	.....	Dip-net haul
1504	000	12:25–12:50 p.m.	42_{x}	32 38.8	117 29.9	0	.....	
1505	000	12:25–12:50 p.m.	42_{x}	32 38.8	117 29.9	0	.....	Same haul as 1504
1506	10	12:25–12:50 p.m.	42_{x}	32 38.8	117 29.9	0	.....	
1507	20	12:25–12:50 p.m.	42_{x}	32 38.8	117 29.9	0	.....	
				June 27, 1908				
1508	000	5:50 a.m.	40_{11}	32 54.1	117 21.0	275–0	.....	
1509	000	5:58–6:15 a.m.	40_{11}	32 54.1	117 21.0	0	.....	Same haul as 1508
1510	10	5:58–6:15 a.m.	40_{11}	32 54.1	117 21.0	0	.....	
1511	20	5:58–6:15 a.m.	40_{11}	32 54.1	117 21.0	0	.....	
1512	000	6:20–6:45 a.m.	40_{11}	32 54.1	117 21.0	0	.....	
1513	10	6:20–6:45 a.m.	40_{11}	32 54.1	117 21.0	0	.....	
1514	20	6:20–6:45 a.m.	40_{11}	32 54.1	117 21.0	0	.....	
				June 30, 1908				
1516	000	9:00 a.m.	40_{11}	32 54.4	117 21.5	455–0	.....	
1517	10	9:20–9:45 a.m.	40_{11}	32 54.4	117 21.5	0	.....	
1518	000	9:50–10:05 a.m.	40_{11}	32 54.4	117 21.5	0	.....	
1519	10	9:50–10:05 a.m.	40_{11}	32 54.4	117 21.5	0	.....	
1520	20	9:50–10:05 a.m.	40_{11}	32 54.4	117 21.5	0	.....	
1521	K.B.	2:55 p.m.	40_{11}	32 54.4	117 21.5	505	144	
				July 1, 1908				
1523	K.B.	11:16 a.m.	50_{11}	33 11.3	118 8.1	365	162	
1524	000	12:15 p.m.	50_{11}	33 11.3	118 8.1	275–0	.....	
				July 2, 1908				
1527	000	11:20 a.m.	50_{13}	32 58.4	118 13.6	920–0	.....	
1528	10	11:20 a.m.	50_{13}	32 58.4	118 13.6	920–0	.....	
1529	20	11:20 a.m.	50_{13}	32 58.4	118 13.6	920–0	.....	
1530	000	11:40–11:59 a.m.	50_{11}	32 58.4	118 13.6	0	182	
				July 7, 1908				
1532	000	9:30–10:30 a.m.	52_{x}	32 45.6	118 20.5	0	227	
1533	20	9:30–10:30 a.m.	52_{x}	32 45.6	118 20.5	0	227	
				July 8, 1908				
1535	000	7:35–7:54 p.m.	52_{x}	33 21.9	118 19.1	0	237a	
1537	10	7:35–7:54 p.m.	52_{x}	33 21.9	118 19.1	0	237a	
1538	20	7:35–7:54 p.m.	52_{x}	33 21.9	118 19.1	0	237a	
				July 9, 1908				
1542	K.000	6:45–7:00 p.m.	54_{12}	33 0.2	118 31.3	92	.....	
				July 10, 1908				
1543	K.B.	7:17 a.m.	50_{11}	32 53.4	118 10.2	825	245	
1544	K.B.	8:25 a.m.	50_{11}	32 53.4	118 10.2	640	.....	Imperfectly closed
1545	K.B.	8:56 a.m.	50_{11}	32 53.4	118 10.2	460	.....	Imperfectly closed
1546	K.B.	10:10 a.m.	50_{11}	32 53.4	118 10.2	275	.....	Imperfectly closed
1547	K.B.	10:34 a.m.	50_{11}	32 53.4	118 9.1	135	246	
1548	K.B.	10:59 a.m.	49_{11}	32 53.5	118 7.4	640	248	
				July 16, 1908				
1549	K.B.	10:05 a.m.	51_{10}	32 48.7	118 14.5	640	324	
1550*	K.000	.....	51_{10}	32 49.2	118 14.9	640	.....	
				July 17, 1908				
1553	.....	.....	61_{5}	32 24.2	119 6.2	0	.....	Dip-net haul
1557	K.000	1:45–2:30 p.m.	61_{5}	32 24.2	119 6.2	460	.....	
1558	000	8:00–9:00 p.m.	61_{5}	32 24.2	119 6.2	0	.....	Haul formerly labelled 1562

* Haul 1550 began at 11:45 a.m. and ended at 12:40 p.m.

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				July 18, 1908				
1559	000	6:20–6:30 a.m.	61_{5}	32° 24.2	119° 6.2	0	347	
1560	000	7:20–8:00 a.m.	61_{5}	32 24.2	119 6.2	0	....	
				July 21, 1908				
1563	K.B.	11:29 a.m.	42_{10}	32 49.6	117 28.8	640	386	
1564	K.B.	11:47 a.m.	42_{10}	32 49.6	117 28.8	460	388	
1565	K.B.	12:40 p.m.	42_{5}	32 49.6	117 28.8	135	391	
1566	K.B.	12:58 p.m.	42_{3}	32 49.6	117 28.8	275	392	
1567	K.000	1:06–1:29 p.m.	42_{5}	32 49.6	117 28.8	640	....	
1568	000	2:45–3:13 p.m.	42_{20}	32 49.6	117 28.8	0	395	
1569	10	2:45–3:13 p.m.	42_{10}	32 49.6	117 28.8	0	395	
				July 22, 1908				
1570	K.000	7:57–8:13 a.m.	43_{0}	32 50.1	117 34.0	37	....	Net failed to close
1571	000	8:09–8:50 a.m.	43_{0}	32 50.6	117 33.7	0	402	
1572	K.000	9:16–9:29 a.m.	43_{0}	32 51.4	117 33.3	55	....	
1573	K.000	9:54–10:08 a.m.	42_{0}	32 53.3	117 32.3	92	....	
1574	000	10:13–10:31 a.m.	42_{0}	32 53.3	117 32.3	0	406	
1575	K.000	10:44–10:55 a.m.	42_{0}	32 53.8	117 31.8	137	.....	
1576	K.000	12:33–12:46 p.m.	42_{0}	32 55.6	117 30.4	365	....	
1577	000	12:55–1:15 p.m.	42_{0}	32 56.3	117 29.8	0	411	
1578	K.000	1:52–2:07 p.m.	42_{0}	32 57.6	117 28.8	550	.....	
1579	000	7:30–7:50 p.m.	$(40)_{10}$	32 51.5	117 21.4	0	416	
1580	10	7:30–7:50 p.m.	$(40)_{10}$	32 51.5	117 21.4	0	416	
1581	20	7:30–7:50 p.m.	$(40)_{10}$	32 51.5	117 21.4	0	416	
1582	000	8:10–8:35 p.m.	$(40)_{10}$	32 51.9	117 21.6	0	418	
1583	10	8:10–8:35 p.m.	$(40)_{10}$	32 51.9	117 21.6	0	418	
1584	20	8:10–8:35 p.m.	$(40)_{10}$	32 51.9	117 21.6	0	418	
				July 23, 1908				
1585	000	4:27–4:50 a.m.	$(40)_{10}$	32 51.5	117 22.0	0	421	
1586	10	4:27–4:50 a.m.	$(40)_{10}$	32 51.5	117 22.0	0	421	
1587	20	4:27–4:50 a.m.	$(40)_{10}$	32 51.5	117 22.0	0	421	
1588	000	5:05–5:30 a.m.	$(40)_{10}$	32 52.1	117 20.2	0	422	
1589	10	5:05–5:30 a.m.	$(40)_{10}$	32 52.1	117 20.2	0	422	
1590	20	5:05–5:30 a.m.	$(40)_{5}$	32 52.1	117 20.2	0	422	
1591	000	7:48–8:10 p.m.	$(40)_{10}$	32 51.7	117 20.7	0	425	
1592	10	7:48–8:10 p.m.	$(40)_{5}$	32 51.7	117 20.7	0	425	
1593	20	7:48–8:10 p.m.	$(40)_{1}$	32 51.7	117 20.7	0	425	
1594	000	8:20–8:42 p.m.	$(40)_{1}$	32 51.8	117 22.0	0	426	
1595	10	8:20–8:42 p.m.	$(40)_{5}$	32 51.8	117 22.0	0	426	
1596	20	8:20–8:42 p.m.	$(40)_{1}$	32 51.8	117 22.0	0	426	
				July 24, 1908				
1597	000	4:26–4:46 a.m.	$(40)_{10}$	32 51.4	117 22.2	0	430	
1598	10	4:26–4:46 a.m.	$(40)_{10}$	32 51.4	117 22.2	0	430	
1599	20	4:26–4:46 a.m.	$(40)_{10}$	32 51.4	117 22.2	0	430	
1600*	000	4:58–5:18 a.m.	$(40.5)_{10}$	32 51.5	117 22.6	0	431, 432	
1601*	10	4:58–5:18 a.m.	$(40.5)_{10}$	32 51.5	117 22.6	0	431, 432	
1602*	20	4:58–5:18 a.m.	$(40.5)_{10}$	32 51.5	117 22.6	0	431, 432	
1603	K.000	12:33–12:41 p.m.	41_{0}	32 51.4	117 18.2	92	....	
1604	10	12:50–1:00 p.m.	41_{0}	32 51.4	117 18.2	0	....	
				August 26, 1908				
1605	000	7:00–7:20 p.m.	41^{8}	31 18.8	117 27.1	0	467, 468	
1606	10	7:00–7:20 p.m.	41^{8}	31 18.8	117 27.1	0	467, 468	
1607	20	7:00–7:20 p.m.	41^{8}	31 18.8	117 27.1	0	467, 468	
				August 29, 1908				
1608	K.B.	10:40 a.m.	51^{35}	29 7.4	118 17.0	1540	549	
1609	K.B.	11:45 a.m.	51^{34}	29 7.6	118 16.9	1100	553	
1610	K.B.	12:30 p.m.	51^{34}	29 7.8	118 16.9	730	556	
1611	K.B.	12:50 p.m.	51^{34}	29 7.8	118 16.9	550	558	
1612	K.B.	1:45 p.m.	51^{34}	29 8.0	118 16.9	365	561	
1613	K.B.	1:58 p.m.	51^{34}	29 8.1	118 16.9	275	563	
1614	K.B.	2:22 p.m.	51^{34}	29 8.2	118 16.9	185	566	
1615	K.B.	2:40 p.m.	51^{34}	29 8.3	118 16.9	137	568	
1616	K.B.	2:54 p.m.	51^{34}	29 8.4	118 16.9	92	569	
1617	K.B.	3:05 p.m.	51^{34}	29 8.5	118 16.8	46	571	
1618	K.B.	3:21 p.m.	51^{34}	29 8.5	118 16.8	1280	573	

* From 4:55 to 5:15 a.m. the boat drifted from the position entered to 32° 51.2 N 117° 22.0 W.

Table 5.—Data Relative to Plankton Hauls—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				August 30, 1908				
1619	K.000	9:20–9:32 a.m.	51^{34}	29° 7.8	118° 16.9	46	.....	Failed to close
1620	K.000	10:03–10:14 a.m.	51^{34}	29 8.6	118 16.8	92	.....	
1621	K.000	10:52–11:01 a.m.	51.5^{34}	29 8.6	118 17.5	185	.....	
				August 31, 1908				
1622	K.B.	8:50 a.m.	26^{44}	28 20.8	116 10.8	1430	648	
1623	K.B.	9:48 a.m.	26^{44}	28 20.8	116 10.8	1100	652	
1624	K.B.	10:30 a.m.	26^{44}	28 20.8	116 10.8	730	655	
1625	K.B.	10:58 a.m.	26^{44}	28 20.8	116 10.8	365	657	
1626	K.B.	11:18 a.m.	26^{44}	28 20.8	116 10.8	185	659	
1627	K.B.	11:30 a.m.	26^{44}	28 20.8	116 10.8	137	661	
1628	K.B.	11:43 a.m.	26^{44}	28 20.8	116 10.8	92	663	
1629	K.B.	11:54 a.m.	26^{44}	28 20.8	116 10.8	46	664	
				February 19, 1909				
1634	000	5:50–6:20 a.m.	44_8	32 41.5	117 39.7	0	882, 883	
1635	12	5:50–6:20 a.m.	44_8	32 41.5	117 39.7	0	882, 883	
1636	K.B.	7:55 a.m.	44_8	32 41.5	117 39.7	920	.....	Imperfectly closed
1637	K.B.	8:35 a.m.	44_8	32 41.5	117 39.7	460	.....	Imperfectly closed
1638	K.B.	9:05 a.m.	44_8	32 41.5	117 39.7	185	891	
1639	K.B.	9:10 a.m.	44_8	32 41.5	117 39.7	92	892	
1640	K.B.	9:27 a.m.	44_8	32 41.5	117 39.7	46	894	
				June 15, 1909				
1641*	20	.....	42_{10}	32 52.3	117 31.8	0	.....	
1642*	12	.....	42_{10}	32 52.3	117 31.8	0	.....	
1643*	000	.....	42_{10}	32 52.3	117 31.8	0	.....	
1644	K.B.	12:40 p.m.	42_{10}	32 51.5	117 30.6	365	977	
1645	K.B.	12:55 p.m.	42_{10}	32 51.3	117 30.0	275	.....	Imperfectly closed
1646	K.B.	1:10 p.m.	42_{10}	32 51.0	117 29.2	185	978	
1647	K.B.	1:15 p.m.	42_{10}	32 51.2	117 28.8	92	979	
				June 16, 1909				
1648	K.B.	3:36 p.m.	42_{10}	32 52.1	117 32.1	730	981	
1649	K.B.	4:05 p.m.	42_{10}	32 51.9	117 31.5	550	983	
1650	000	5:05–5:50 p.m.	42_{10}	32 51.7	117 32.4	0	.....	
1651	12	5:05–5:50 p.m.	42_{10}	32 51.7	117 32.4	0	.....	
1652	12	6:10–6:45 p.m.	42_{10}	32 51.7	117 32.4	0	984	
1653	000	6:10–6:45 p.m.	42_{10}	32 51.7	117 32.4	0	984	Sun-down 6:54
1654	12	6:55–7:20 p.m.	42_{10}	32 50.9	117 31.8	0	.....	p.m.
1655	000	6:55–7:20 p.m.	42_{10}	32 50.9	117 31.8	0	.....	
1656	12	7:25–8:00 p.m.	42_{10}	32 50.9	117 31.8	0	985	
1657	000	7:25–8:00 p.m.	42_{10}	32 50.9	117 31.8	0	985	
				June 17, 1909				
1658	12	5:00–6:00 p.m.	(39_{10})	32 51.3	117 16.7	0	.....	Surface tempera-
1659	000	5:00–6:00 p.m.	(39_{10})	32 51.3	117 16.7	0	.....	ture correspond-
1660	000	6:00–6:45 p.m.	(39_{10})	32 51.3	117 16.7	0	.....	ing to hauls
1661	000	6:45–7:30 p.m.	(39_{10})	32 51.3	117 16.7	0	.....	1658–1662 was
1662	000	7:30–8:00 p.m.	(39_{10})	32 51.3	117 16.7	0	.....	18°4. Boat at
				June 19, 1909				
1666	12	8:45–9:15 a.m.	39_7	32 37.1	117 14.5	0	.....	mooring
1667	000	8:45–9:15 a.m.	39_7	32 37.1	117 14.5	0	.....	
1668	S.N.1	9:05–9:30 a.m.	39_7	32 37.1	117 14.5	37	.....	
				June 21, 1909				
1671	K.B.	5:36 p.m.	42_{11}	32 52.8	117 32.2	460	988	
1672	12	5:55–6:20 p.m.	42_{10}	32 51.8	117 30.4	0	.....	
1673	000	5:55–6:20 p.m.	42_{10}	32 51.8	117 30.4	0	.....	
1674	K.B.	6:00 p.m.	42_{10}	32 52.0	117 31.3	365	989	
1675	K.B.	6:15 p.m.	42_{10}	32 51.8	117 30.5	275	990	
1676	K.B.	6:36 p.m.	42_{1}	32 51.8	117 29.9	185	991	Sun-down 6:55
1677	S.N.1	6:40 p.m.	42_{10}	32 51.8	117 29.8	92–0	.....	p.m.
1678	K.B.	6:45 p.m.	42_{10}	32 51.7	117 29.7	92	993	
1679	12	7:00–7:35 p.m.	43_{10}	32 52.0	117 32.9	0	.....	
1680	000	7:00–7:35 p.m.	43_{10}	32 52.0	117 32.9	0	.....	
1681	12	7:40–8:15 p.m.	43_{10}	32 52.1	117 33.1	0	994	
1682	000	7:40–8:15 p.m.	43_{10}	32 52.1	117 33.1	0	994	
1683	K.000	8:10–8:40 p.m.	43_{11}	32 52.8	117 33.2	460	.....	
1684	K.000	9:20–9:45 p.m.	43_{11}	32 53.0	117 32.7	275	.....	

* Hauls began at 11:45 a.m. and ended at 12:45 p.m.

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				June 22, 1909				
1685	12	4:00–5:00 a.m.	43_{11}	32° 53.2	117° 36.5	0	995	
1686	000	4:00–5:00 a.m.	43_{11}	32 53.2	117 36.5	0	995	
1687	000	4:00–5:00 a.m.	43_{11}	32 53.2	117 36.5	0	995	Same haul as 1686
1688	L.N.1	4:40–5:20 a.m.	43_{11}	32 52.6	117 36.6	185	.....	
1689	000	5:15–6:10 a.m.	43_{11}	32 52.8	117 35.7	0	996	
1690	K.000	6:35–6:50 a.m.	43_{11}	32 52.9	117 35.6	365	.....	
				June 23, 1909				
1691	L.N.1	4:55–5:20 a.m.	42_{10}	32 52	117 30	185	.....	
1692	K.B.	5:50 a.m.	42_{10}	32 52	117 30	460	.....	Imperfectly closed
1693	K.B.	6:00 a.m.	42_{10}	32 52	117 30	185	998	
1694	12	4:55–6:00 a.m.	42_{10}	32 52	117 30	0	997, 999	
1695	000	4:55–6:00 a.m.	42_{10}	32 52	117 30	0	997, 999	
1697	12	6:10–6:50 a.m.	42_{10}	32 52	117 30	0	.....	
1698	000	6:10–6:50 a.m.	42_{10}	32 52	117 30	0	.....	
1699	K.000	6:35–7:00 a.m.	42_{10}	32 52	117 30	460	.....	
1700	K.000	7:25–7:45 a.m.	42_{10}	32 52	117 30	365	.....	
1701	K.000	8:15–8:25 a.m.	42_{10}	32 52	117 30	275	.....	
1702	12	7:00–8:55 a.m.	42_{10}	32 52	117 30	0	1000	
1703	000	7:00–8:55 a.m.	42_{10}	32 52	117 30	0	1000	
1704	K.000	8:55–9:17 a.m.	42_{10}	32 52	117 30	92	.....	
				June 24, 1909				
1705	K.B.	3:55 p.m.	42_{10}	32 52	117 30	640	1002	Struck bottom
1706	K.B.	4:27 p.m.	42_{10}	32 52	117 30	550	.....	Imperfectly closed
1707	K.B.	4:50 p.m.	42_{10}	32 52	117 30	460	1003	
1708	S.N.1	4:58–5:15 p.m.	42_{10}	32 52	117 30	92	.....	
1709	K.B.	5:50 p.m.	42_{10}	32 52	117 30	365	1005	
1710	K.B.	6:05 p.m.	42_{10}	32 52	117 30	275	1006	
1711	12	5:05–6:15 p.m.	42_{10}	32 52	117 30	0	1004	
1712	000	5:05–6:15 p.m.	42_{10}	32 52	117 30	0	1004	
1714	K.000	6:25–6:45 p.m.	42_{10}	32 52	117 30	185	.....	
1715	12	6:20–7:05 p.m.	42_{10}	32 52	117 30	0	1007	
1716	000	6:20–7:05 p.m.	42_{10}	32 52	117 30	0	1007	
1717	K.000	7:15–7:35 p.m.	42_{10}	32 52	117 30	550	.....	
1718	12	7:15–8:23 p.m.	42_{10}	32 52	117 30	0	1008, 1009	
1719	000	7:15–8:23 p.m.	42_{10}	32 52	117 30	0	1008, 1009	
				June 25, 1909				
1721	K.B.	3:47 p.m.	42_{10}	32 52	117 30	460	1010	
1722	K.B.	4:07 p.m.	42_{10}	32 52	117 30	365	1012	
1723	K.B.	4:25 p.m.	42_{10}	32 52	117 30	275	1013	
1724	K.B.	4:44 p.m.	42_{10}	32 52	117 30	460	1014	
1725	S.N.1	4:44–5:15 p.m.	42_{10}	32 52	117 30	185	.....	
1726	K.000	5:00–5:55 p.m.	42_{10}	32 52	117 30	550	.....	
1727	12	5:10–6:10 p.m.	42_{10}	32 52	117 30	0	1015	
1728	000	5:10–6:10 p.m.	42_{10}	32 52	117 30	0	1015	
1729	K.000	6:13–6:35 p.m.	42_{10}	32 52	117 30	460	.....	
1730	12	6:15–7:00 p.m.	42_{10}	32 52	117 30	0	1015, 1016	Water was brilliantly phosphorescent throughout the evening
1731	000	6:15–7:00 p.m.	42_{10}	32 52	117 30	0	1015, 1016	
1732	K.000	6:53–7:14 p.m.	42_{10}	32 52	117 30	400	.....	
1733	12	7:03–7:40 p.m.	42_{10}	32 52	117 30	0	1016, 1017	
1734	000	7:03–7:40 p.m.	42_{10}	32 52	117 30	0	1016, 1017	
1735	K.000	7:34–7:54 p.m.	42_{10}	32 52	117 30	295	.....	
1736	K.000	8:12–8:32 p.m.	42_{10}	32 52	117 30	200	.....	
1737	12	7:45–8:41 p.m.	42_{10}	32 52	117 30	0	1017, 1018	
1738	000	7:45–8:41 p.m.	42_{10}	32 52	117 30	0	1017, 1018	
1739	K.000	8:41–9:01 p.m.	42_{10}	32 52	117 30	92	.....	
				June 28, 1909				
1740	K.B.	4:43 p.m.	42_{10}	32 52	117 30	730	1020	
1741	K.B.	5:10 p.m.	42_{10}	32 52	117 30	715	.....	Imperfectly closed
1742	K.B.	6:00 p.m.	42_{10}	32 52	117 30	365	1021	
1743	12	5:00–6:20 p.m.	42_{10}	32 52	117 30	0	1022	
1744	000	5:00–6:20 p.m.	42_{10}	32 52	117 30	0	1022	
1745	K.000	6:28–6:48 p.m.	42_{10}	32 52	117 30	365	.....	
1746	12	6:35–7:11 pm..	42_{10}	32 52	117 30	0	1023	
1747	000	6:35–7:11 p.m.	42_{10}	32 52	117 30	0	1023	
1748	K.000	7:10–7:35 p.m.	42_{10}	32 52	117 30	46	.....	

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				July 18, 1908				
1750	12	7:15–8:00 p.m.	42_{10}	32° 52′	117° 30′	0	1023	
1751	000	7:15–8:00 p.m.	42_{10}	32 52	117 30	0	1023	
1752	K.000	7:42–8:05 p.m.	42_{10}	32 52	117 30	92	....	
1753	K.000	8:15–8:38 p.m.	42_{10}	32 52	117 30	185	.....	
1754	000	8:10–8:50 p.m.	42_{10}	32 52	117 30	0	1024	
1755	12	8:10–8:50 p.m.	42_{10}	32 52	117 30	0	1024	
1756	K.000	8:50–9:16 p.m.	42_{10}	32 52	117 30	275	.....	
				June 29, 1909				
1757	K.000	4:30–4:40 a.m.	42_{10}	32 52	117 30	185	.....	Net badly torn
1758	12	4:30–5:30 a.m.	42_{10}	32 52	117 30	0	1025	
1759	000	4:30–5:30 a.m.	42_{10}	32 52	117 30	0	1025	
1760	K.000	5:25–5:50 a.m.	42_{10}	32 52	117 30	92	....	
1761	K.000	5:55–6:20 a.m.	42_{10}	32 52	117 30	46	.....	
1762	12	5:40–6:35 a.m.	42_{10}	32 52	117 30	0	1026	
1763	000	5:40–6:35 a.m.	42_{10}	32 52	117 30	0	1026	
1764	K.000	6:30 7:10 a.m.	42_{10}	32 52	117 30	275	.....	
				June 30, 1909				
1766	12	4:00–4:25 p.m.	49_{11}	32 50.1	118 3.1	0	1045	
1767	000	4:00–4:25 p.m.	49_{10}	32 50.1	118 3.1	0	1045	
1768	12	8:15–9:00 p.m.	53_{10}	32 49.1	118 23.0	0	1054	
1769	000	8:15 9:00 p.m.	53_{10}	32 49.1	118 23.0	0	1054	
				July 1, 1909				
1770	S.N.1	7:25 7:45 a.m.	53_{10}	32 47.7	118 26.3	37	.....	
1771	12	7:55–8:23 a.m.	53_{10}	32 48.1	118 25.7	0	1060	
1772	000	7:55–8:23 a.m.	53_{11}	32 48.1	118 25.7	0	1060	
1773	K.B.	10:56 a.m.	52_{10}	32 52.0	118 21.5	825	1063	
1774	K.B.	11:27 a.m.	52_{10}	32 52.0	118 21.5	640	1064	
1775	K.B.	11:53 a.m.	52_{10}	32 52.0	118 21.5	460	.....	Imperfectly closed
1776	K.B.	12:12 p.m.	52_{10}	32 52.0	118 21.5	275	1065	
1777	K.B.	12:30 p.m.	52_{10}	32 52.0	118 21.5	365	1066	
1778*	12	.....	52_{10}	32 52.0	118 21.5	0	.....	
1779*	000	.....	52_{10}	32 52.0	118 21.5	0	.....	
				July 2, 1909				
1783	12	4:50 5:11 a.m.	52_{10}	32 48.6	118 20.4	0	1068, 1069	
1784	000	4:50–5:11 a.m.	52_{10}	From 4:50 to 7:15		0	1068, 1069	
1785	S.N.1	5:00–5:23 a.m.	52_{10}	a.m. the boat		37	.....	
1786	12	5:56 6:30 a.m.	52_{11}	drifted from the		0	1071, 1072	
1787	000	5:56–6:30 a.m.	52_{11}	above position		0	1071, 1072	
1788	S.N.1	6:00 6:35 a.m.	52_{11}	to the following		46	.....	
1789	S.N.1	6:36–6:48 a.m.	52_{11}	position		22	.....	
1790	12	6:37 7:00 a.m.	52_{10}			0	1073	
1791	000	6:37 7:00 a.m.	52_{10}			0	1073	
1792	S.N.1	6:50 7:10 a.m.	52_{10}	32 48.0	118 17.5	11	.....	
1793†	S.N.1	9:38–9:48 a.m.	47_{1}	32 44.5	117 53.5	46	.....	
1794‡	S.N.1	9:52–10:09 a.m.	46.5_{3}	32 44.5	117 53.5	22	.....	
1795‡	12	9:38–10:11 a.m.	46.5_{3}	32 44.5	117 53.5	0	1081, 1082	
1796‡	000	9:38–10:11 a.m.	46.5_{3}	32 44.5	117 53.5	0	1081, 1082	
1797	S.N.1	12:45–1:05 p.m.	42_{5}	32 41.2	117 32.3	46	.....	
1798	S.N.1	1:10 1:35 p.m.	42_{5}	32 41.2	117 32.3	11	.....	
1799	12	12:45–1:36 p.m.	42_{5}	32 41.2	117 32.3	0	1088, 1089	
1800	000	12:45–1:36 p.m.	42_{5}	32 41.2	117 32.3	0	1088, 1089	
1801	S.N.1	1:38 2:00 p.m.	42_{5}	32 41.2	117 32.3	22	....	
1802	S.N.1	4:23–4:50 p.m.	41_{5}	32 40.0	117 26.0	37	....	
1803	12	4:23–4:50 p.m.	41_{5}	32 40.0	117 26.0	0	1092	
1804	000	4:23–4:50 p.m.	41_{5}	32 40.0	117 26.0	0	1092	
1805	S.N.1	4:55–5:25 p.m.	41_{5}	32 40.0	117 26.0	15	....	
1806	S.N.1	5:35–6:00 p.m.	41_{5}	32 40.0	117 26.0	18	.....	
1807	L.N.1	6:10–6:35 p.m.	41_{5}	32 40.0	117 26.0	22	.....	
1808	L.N.1	6:43 7:05 p.m.	41_{5}	32 40.0	117 26.0	11	.....	
1809	12	6:15–7:05 p.m.	41_{5}	32 40.0	117 26.0	0	1095	
1810	000	6:15–7:05 p.m.	41_{5}	32 40.0	117 26.0	0	1095	

* Haul began 10:52 a.m. and ended at 12:40 p.m.

† From 9:38 to 10:11 a.m. the boat drifted from the position entered to 43° 44′5 N 117° 50′0 W.

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position		Depth in meters	Water sample number	Remarks
				N lat.	W long.			
				July 7, 1909				
1811	12	4:10–4:45 a.m.	42_{10}	32° 52.0	117° 30.0	0	1103	
1812	000	4:10–4:45 a.m.	42_{10}	32 52.0	117 30.0	0	1103	
1813	K.000	4:25–5:00 a.m.	42_{10}	32 52.0	117 30.0	185	.....	
1814	12	4:50–5:35 a.m.	42_{10}	32 52.0	117 30.0	0	1104	
1815	000	4:50–5:35 a.m.	42_{10}	32 52.0	117 30.0	0	1104	
1816	K.000	5:30–5:55 a.m.	42_{10}	32 52.0	117 30.0	92	.....	
1817	K.000	6:05–6:25 a.m.	42_{10}	32 52.0	117 30.0	46	.....	
1818	12	5:40–6:35 a.m.	42_{10}	32 52.0	117 30.0	0	1105	
1819	000	5:40–6:35 a.m.	42_{10}	32 52.0	117 30.0	0	1105	
1820	K.000	6:32–6:55 a.m.	42_{10}	32 52.0	117 30.0	18	.....	
1821	K.000	7:07–7:35 a.m.	42_{10}	32 52.0	117 30.0	9	.....	
1822	12	6:40–7:36 a.m.	42_{10}	32 52.0	117 30.0	0	1105	
1823	000	6:40–7:36 p.m.	42_{10}	32 52.0	117 30.0	0	1105	
1824	K.000	6:30–6:50 p.m.	40_{11}	32 53.2	117 20.0	185	.....	
1825	12	6:00–7:00 p.m.	40_{11}	32 53.2	117 20.0	0	1106, 1107	
1826	000	6:00–7:00 p.m.	40_{11}	32 53.2	117 20.0	0	1106, 1107	
1827	S.N.1	6:40–7:03 p.m.	40_{11}	32 53.2	117 20.0	8	.....	
1828	K.000	6:55–7:20 p.m.	40_{11}	32 53.2	117 20.0	92	.....	
1830	K.000	7:25–7:45 p.m.	40_{11}	32 53.2	117 20.0	46	.....	
1831	12	7:04–7:50 p.m.	40_{11}	32 53.2	117 20.0	0	1107, 1108	
1832	000	7:04–7:50 p.m.	40_{11}	32 53.2	117 20.0	0	1107, 1108	
1833	S.N.1	7:05–7:52 p.m.	40_{11}	32 53.2	117 20.0	16	.....	
1834	K.000	7:51–8:20 p.m.	40_{11}	32 53.2	117 20.0	27	.....	
1835	12	7:55–8:25 p.m.	40_{11}	32 53.2	117 20.0	0	1108, 1109	
1836	000	7:55–8:25 p.m.	40_{11}	32 53.2	117 20.0	0	1108, 1109	
				July 8, 1909				
1837	000	10:20–11:05 a.m.	$(40)_{10}$	32 51.3	117 18.8	0	.....	
1838	000	11:20 a.m.	$(40)_{10}$	32 51.3	117 18.8	37–0	.....	
1839	K.000	11:45–11:55 a.m.	$(40)_{10}$	32 52.0	117 19.2	27	.....	
1840	K.000	12:35–12:45 p.m.	$(40)_{10}$	32 52.2	117 19.3	18	.....	
1841	S.N.1	12:40–1:00 p.m.	$(40)_{10.5}$	32 52.5	117 19.5	14	.....	
1842	K.000	12:55–1:05 p.m.	$(40)_{10.5}$	32 52.5	117 19.5	9	.....	
1843	K.000	1:17–1:28 p.m.	$(40)_{10.5}$	32 52.5	117 19.5	9	.....	
1844	K.000	1:35–1:45 p.m.	$(40)_{10.5}$	32 52.5	117 19.0	55	.....	
1845	K.000	1:50–2:00 p.m.	$(40)_{10}$	32 52.3	117 18.6	27	.....	
1846	K.000	2:10–2:20 p.m.	$(40)_{10}$	32 52.1	117 18.4	92	.....	
1847	000	2:45 p.m.	(39_{10})	32 52.0	117 17.4	275–0	.....	
				July 9, 1909				
1848	K.000	3:50–4:00 a.m.	$(40)_{10}$	32 52.3	117 20.0	140	.....	Failed to close
1849	12	3:30–4:15 a.m.	$(40)_{10}$	32 52.3	117 20.0	0	1112, 1113	
1850	000	3:30–4:15 a.m.	$(40)_{10}$	32 52.3	117 20.0	0	1112, 1113	
1851	K.000	4:33–4:43 a.m.	$(40)_{10}$	32 52.3	117 20.0	46	.....	
1852	K.000	4:53–5:05 a.m.	$(40)_{10}$	32 52.3	117 20.0	27	.....	
1853	12	4:20–5:15 a.m.	$(40)_{10}$	32 52.3	117 20.0	0	1113, 1114	
1854	000	4:20–5:15 a.m.	$(40)_{10}$	32 52.3	117 20.0	0	1113, 1114	
1855	K.000	5:12–5:22 a.m.	$(40)_{10}$	32 52.3	117 20.0	18	.....	
1856	K.000	5:27–5:40 a.m.	$(40)_{10}$	32 52.3	117 20.0	9	.....	
1857	K.000	5:50–6:03 a.m.	$(40)_{10}$	32 52.3	117 20.0	92	.....	
1858	K.000	6:10–6:23 a.m.	$(40)_{10}$	32 52.3	117 20.0	64	.....	
1859	12	5:18–6:25 a.m.	$(40)_{10}$	32 52.3	117 20.0	0	1115	
1860	000	5:18–6:25 a.m.	$(40)_{10}$	32 52.3	117 20.0	0	1115	
1861	K.000	6:18–6:30 p.m.	$(40)_{10}$	32 52.3	117 20.0	55	.....	
1862	K.000	6:38–6:48 p.m.	$(40)_{10}$	32 52.3	117 20.0	27	.....	
1863	12	6:15–7:00 p.m.	$(40)_{10}$	32 52.3	117 20.0	0	1116	
1864	000	6:15–7:00 p.m.	$(40)_{10}$	32 52.3	117 20.0	0	1116	
1865	K.000	6:53–7:08 p.m.	$(40)_{10}$	32 52.3	117 20.0	14	.....	
1866	K.000	7:15–7:25 p.m.	$(40)_{10}$	32 52.3	117 20.0	92	.....	
1867	12	7:03–7:36 p.m.	$(40)_{10}$	32 52.3	117 20.0	0	1116	
1868	000	7:03–7:36 p.m.	$(40)_{10}$	32 52.3	117 20.0	0	1116	
1869	K.000	7:35–7:45 p.m.	$(40)_{10}$	32 52.3	117 20.0	185	.....	
1870	K.000	7:55–8:05 p.m.	$(40)_{10}$	32 52.3	117 20.0	46	.....	
1871	12	7:40–8:15 p.m.	$(40)_{10}$	32 52.3	117 20.0	0	1117, 1118	
1872	000	7:40–8:15 p.m.	$(40)_{10}$	32 52.3	117 20.0	0	1117, 1118	
1873	K.000	8:16–8:26 p.m.	$(40)_{10}$	32 52.3	117 20.0	9	.....	

Table 5.—Data Relative to Plankton Hauls—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
			July 9, 1909					
1874	12	8:45–11:35 p.m.	$(40)_{10}$	32° 52.3	117° 20.0	0	1119	
1875	000	8:45–11:35 p.m.	$(40)_{10}$	32 52.3	117 20.0	0	1119	
1876	K.000	11:30–11:45 p.m.	$(40)_{10}$	32 52.3	117 20.0	46	.....	
1877	K.000	11:49–11:59 p.m.	$(40)_{10}$	32 52.3	117 20.0	27	.....	
			July 10, 1909					
1878	K.000	12:12–12:23 a.m.	$(40)_{10}$	32 52.3	117 20.0	18	.....	
1879	K.000	12:27–12:37 a.m.	$(40)_{10}$	32 52.3	117 20.0	9	.....	
1880*	12	.....	$(40)_{10}$	32 52.3	117 20.0	0	1119, 1120	
1881*	000	.....	$(40)_{10}$	32 52.3	117 20.0	0	1119, 1120	
1882	12	12:55–4:28 a.m.	40_{11}	32 53.0	117 18.0	0	1121	
1883	000	12:55–4:28 a.m.	40_{11}	32 53.0	117 18.0	0	1121	
1884	K.000	4:25–4:40 a.m.	40_{11}	32 53.0	117 18.0	46	.....	
1885	K.000	4:45–4:55 a.m.	40_{11}	32 53.0	117 18.0	27	.....	
1886	K.000	5:03–5:15 a.m.	40_{11}	32 53.0	117 18.0	18	.....	
1887	12	4:35–5:20 a.m.	40_{11}	32 53.0	117 18.0	0	1122	
1888	000	4:35–5:20 a.m.	40_{11}	32 53.0	117 18.0	0	1122	
1889	K.000	5:19–5:30 a.m.	40_{11}	32 53.0	117 18.0	9	.....	
1890	K.000	5:36–5:50 a.m.	40_{11}	32 53.0	117 18.0	92	.....	Failed to close
1891	12	5:25–5:55 a.m.	40_{11}	32 53.0	117 18.0	0	1122, 1123	
1892	000	5:25–5:55 a.m.	40_{11}	32 53.0	117 18.0	0	1122, 1123	
			August 31, 1909					
1894	K.B.	1:50 p.m.	53_{11}	32 53.1	118 24.5	365	.....	
1895	K.B.	2:10 p.m.	53_{11}	32 53.1	118 24.5	460	1185	
1896	K.B.	2:21 p.m.	53_{11}	32 53.1	118 24.5	275	1187	
1897	K.B.	2:45 p.m.	53_{11}	32 53.1	117 24.5	365	.....	
1898	K.B.	3:00 p.m.	53_{11}	32 53.1	117 24.5	137	.....	Imperfectly closed
1899	K.B.	3:02 p.m.	53_{11}	32 53.1	117 24.5	92	1190	
1900	K.B.	3:10 p.m.	53_{11}	32 53.1	117 24.5	135	1191	
1901	K.B.	3:25 p.m.	53_{11}	32 53.1	117 24.5	46	1193	
			September 1, 1909					
1902	000	5:46–6:06 a.m.	53_{8}	32 47.3	118 27.3	0	1203	
1903	12	5:46–6:06 a.m.	53_{8}	32 47.3	118 27.3	0	1203	
1905	K.B.	8:22 a.m.	55_{10}	32 51.2	118 35.5	475	1213	Struck bottom
1906	000	12:40–12:50 p.m.	56_{12}	33 0.0	118 41.2	0	1237	
1907	12	12:40–12:50 p.m.	56_{12}	33 0.0	118 41.2	0	1237	
1908	20	12:40–12:50 p.m.	56_{12}	33 0.0	118 41.2	0	1237	
1909	L.N.1	12:55–1:25 p.m.	56_{12}	33 0.0	118 41.2	92	.....	
			September 2, 1909					
1910	000	5:52–6:13 a.m.	55_{7}	32 37.2	118 37.2	0	1262	
1911	12	5:52–6:13 a.m.	55_{7}	32 37.2	118 37.2	0	1262	
1912	20	5:52–6:13 a.m.	55_{7}	32 37.2	118 37.2	0	1262	
1914	K.B.	10:09 a.m.	60_{5}	32 22.6	118 58.5	320	.....	Mud haul
1915	000	2:05–2:27 p.m.	61_{6}	32 28.0	119 3.0	0	1298	
1916	12	2:05–2:27 p.m.	61_{6}	32 28.0	119 3.0	0	1298	
1917	20	2:05–2:27 p.m.	61_{6}	32 28.0	119 3.0	0	1298	
1918	12	6:20–6:40 p.m.	56_{8}	32 40.0	118 39.2	0	1314, 1315	
1919	20	6:20–6:40 p.m.	56_{8}	32 40.0	118 39.2	0	1314, 1315	
			September 3, 1909					
1920	000	6:00–6:37 a.m.	52_{10}	32 48.5	118 20.3	0	1323, 1324	
1921	12	6:00–6:37 a.m.	52_{10}	32 48.5	118 20.3	0	1323, 1324	
1922	20	6:00–6:37 a.m.	52_{10}	32 48.5	118 20.3	0	1323, 1324	
1923	K.000	8:32–8:40 a.m.	49_{10}	32 49.4	118 3.8	46	.....	
1924	K.000	9:14–9:44 a.m.	48_{9}	32 50.1	118 1.5	730	.....	Net struck bottom
1925	K.000	10:41–11:11 a.m.	48_{10}	32 51.2	117 59.1	550	.....	Net slightly torn
1926	K.000	12:21–12:52 p.m.	47_{10}	32 52.1	117 57.0	365	.....	
1927	K.000	1:22–1:49 p.m.	47_{11}	32 52.6	117 55.9	230	.....	
1928	K.000	2:17–2:40 p.m.	47_{11}	32 53.2	117 54.8	137	.....	
1929	K.000	2:53–3:12 p.m.	47_{11}	32 53.6	117 53.7	92	.....	
1930	K.000	3:22–3:37 p.m.	47_{11}	32 53.9	117 53.2	46	.....	
1931	000	6:14–6:43 p.m.	42_{10}	32 52.0	117 30.0	0	1356, 1357	
1932	12	6:14–6:43 p.m.	42_{10}	32 52.0	117 30.0	0	1356, 1357	
1933	20	6:14–6:43 p.m.	42_{10}	32 52.0	117 30.0	0	1356, 1357	

* Haul began 11:35 p.m. July 9 and ended 12:45 a.m. July 10.

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				September 17, 1909				
1934	12	8:00–9:00 a.m	(39.5_{10})	32° 51.2	117° 17.5	0		
				September 27, 1909				
1935	12	8:43–9:00 a.m.	(39.5_{10})	32 51.2	117 17.5	0	1363	
				October 4, 1909				
1936	12	9:10–9:30 a.m.	(39.5_{10})	32 51.2	117 17.5	0	1364, 1365	
				October 11, 1909				
1938	12	9:00–9:20 a.m.	(39.5_{10})	32 51.2	117 17.5	0	1366, 1367	
				October 18, 1909				
1940	12	8:55–9:15 a.m.	(39.5_{10})	32 51.2	117 17.5	0	1368, 1369	
				November 2, 1909				
1941	000	6:00–6:20 a.m.	42_{10}	32 52.0	117 30.0	0	1376, 1377	
1942	12	6:00–6:20 a.m.	42_{10}	32 52.0	117 30.0	0	1376, 1377	
1943	20	6:00–6:20 a.m.	42_{10}	32 52.0	117 30.0	0	1376, 1377	
1944	K.000	6:21–6:41 a.m.	42_{10}	32 52.0	117 30.0	46		Sunrise 6:12 a.m.
1946	K.000	6:50–7:05 a.m.	42_{10}	32 52.0	117 30.0	92		
1947	K.000	7:16–7:30 a.m.	42_{10}	32 52.0	117 30.0	185		
1948	K.000	7:43–8:03 a.m.	42_{10}	32 52.0	117 30.0	365		
1949	K.B.	9:59 a.m.	42_{10}	32 52.0	117 30.0	550		
1950	K.B.	10:20 a.m.	42_{10}	32 52.0	117 30.0	365	1385	
1951	K.B.	10:34 a.m.	42_{10}	32 52.0	117 30.0	185	1386	
1952	K.B.	10:45 a.m.	42_{10}	32 52.0	117 30.0	92		
1953	K.B.	10:53 a.m.	42_{10}	32 52.0	117 30.0	46		
1954	000	12:04–12:26 p.m.	41_{10}	32 52.0	117 26.0	0	1389	
1955	12	12:04–12:26 p.m.	41_{10}	32 52.0	117 26.0	0	1389	
1956	20	12:04–12:26 p.m.	41_{10}	32 52.0	117 26.0	0	1389	
1957	K.B.	1:12 p.m.	40.5_{11}	32 53.8	117 22.5	365	1392	Struck bottom
1958	K.B.	1:12 p.m.	40.5_{11}	32 53.8	117 22.5	365		Mud haul
1959	K.B.	1:32 p.m.	40.5_{11}	32 53.8	117 22.5	185	1393	
1960	K.B.	1:40 p.m.	40.5_{11}	32 53.8	117 22.5	92		
1961	K.B.	1:46 p.m.	40.5_{11}	32 53.8	117 22.5	46		
				November 3, 1909				
1963	K.000	2:53–3:15 p.m.	42_{10}	32 52.0	117 30.0	550		
1964	K.000	4:20–4:35 p.m.	42_{11}	32 53.2	117 30.0	365		
1965	K.000	4:40–4:50 p.m.	42_{11}	32 53.4	117 30.0	185		
1966	K.000	5:06–5:14 p.m.	42_{11}	32 53.6	117 30.0	92		
1967	000	5:05–5:45 p.m.	42_{11}	From 5:00 to 6:00		0	1404	
1968	12	5:05–5:45 p.m.	42_{11}	p.m. boat drifted		0	1404	
1969	20	5:05–5:45 p.m.	42_{11}	from above posi-		0	1404	
1970	K.000	5:20–5:30 p.m.	42_{11}	tion to follow-		55		
1971	K.000	5:33–5:43 p.m.	42_{11}	ing position		37		
1972	K.000	5:47–5:57 p.m.	42_{11}	32 54.1	117 30.0	18		
				November 4, 1909				
1973	K.B.	11:52 a.m.	42_8	32 40.6	117 30.3	1200		Struck bottom
1974	K.B.	12:42 p.m.	42_8	32 40.6	117 30.3	1100		
1975	K.B.	1:18 p.m.	42_8	32 40.6	117 30.3	820		
				November 5, 1909				
1976	K.000	9:45–10:00 a.m.	42_8	32 40.6	117 30.3	1000		
1977	K.000	10:45–11:00 a.m.	42_8	32 40.6	117 30.3	730		
1978	K.000	11:25–11:35 a.m.	42_8	32 40.6	117 30.3	365		
1979	K.000	11:45–11:59 a.m.	42_8	32 40.6	117 30.3	185		
1980	K.000	12:11–12:35 p.m.	42_8	32 40.6	117 30.3	92		
1981*	000		42_8	32 40.6	117 30.3	0	1437	
1982*	12		42_8	32 40.6	117 30.3	0	1437	
1983*	20		42_8	32 40.6	117 30.3	0	1437	
1984	K.000	12:42–12:52 p.m.	42_8	32 40.6	117 30.3	46		
				December 8, 1909				
1985	12	8:45–9:00 a.m.	(39.5_{10})	32 51.2	117 17.5	0	1439	
				December 24, 1909				
1986	12	8:40–8:55 a.m.	(39.5_{10})	32 51.2	117 17.5	0	1440, 1441	
				January 16, 1910				
1987	12	10:00–10:15 a.m.	(39.5_{10})	32 51.2	117 17.5	0	1442, 1443	
				February 3, 1910				
1988	12	9:00–9:20 a.m.	(39.5_{10})	32 51.2	117 17.5	0	1444, 1445	

* Haul began at 11:50 a.m. and ended at 12:42 p.m.

Table 5.—Data Relative to Plankton Hauls—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				February 17, 1910				
1989	S.N.1	6:43 a.m.	42$_{5}$	32° 38′6	117° 28′5	46–29	.....	
1990	S.N.1	7:03 a.m.	42$_{5}$	From 6:13 to 8:07		92–46	.....	
1991	000	6:20–7:15 a.m.	42$_{5}$	a.m. boat drifted		0	1452	Sunrise 6:35 a.m.,
1992	12	6:20–7:15 a.m.	42$_{5}$	from above posi-		0	1452	bright and clear
1993	20	6:20–7:15 a.m.	42$_{5}$	tion to follow-		0	1452	throughout the
1994	S.N.1	7:17 a.m.	42$_{5}$	ing position		137–92	.....	entire day
1995	S.N.1	8:07 a.m.	42$_{5}$	32 40.0	117 32.0	185–137	.....	
1996	S.N.1	8:27 a.m.	42$_{5}$	From 8:07 to 11:47		275–185	.....	
1997	L.N.1	9:35 a.m.	42$_{5}$	a.m. boat drifted		365–275	.....	
1998	000	7:30–9:25 a.m.	42$_{5}$	from above posi-		0	1453	
1999	12	7:30–9:25 a.m.	42$_{5}$	tion to follow-		0	1453	
2000	20	7:30–9:25 a.m.	42$_{5}$	ing position		0	1453	
2001	L.N.1	10:06 a.m.	42$_{5}$			460–365	.....	
2002	L.N.1	10:38 a.m.	42$_{5}$	32 38.5	117 31.5	550–18	.....	
				February 18, 1910				
2003	K.B.	3:10 p.m.	42$_{10}$	32 52.0	117 32.0	365	1465	Weather bright
2004	K.B.	3:21 p.m.	42$_{10}$	From 2:52 to 5:35		275	1466	and clear until
2005	K.B.	3:35 p.m.	42.5$_{10}$	p.m. boat drifted		185	1467	sunset at 5:40
2006	K.B.	3:48 p.m.	43$_{10}$	from the above		92	1469	p.m. Twilight
2007	K.B.	3:55 p.m.	43$_{10}$	position		46	1470	lasted until 7:00
2008	K.B.	4:00 p.m.	43$_{10}$			18	1471	after which it
2009	K.B.	4:21 p.m.	43$_{10}$			550	.....	was clear but
2010	000	2:52–4:25 p.m.	42.5$_{10}$			0	1464, 1468	very dark
2011	12	2:52–4:25 p.m.	42.5$_{10}$			0	1464, 1468	
2012	20	2:52–4:25 p.m.	42.5$_{10}$	32 51.2	117 31.5	0	1464, 1468	
2013	S.N.1	5:52 p.m.	42$_{10}$	32 51.2	117 31.5	550–365	.....	
2014	000	4:50–6:15 p.m.	42$_{10}$	32 51.2	117 31.5	0	1472	
2015	12	4:50–6:15 p.m.	42$_{10}$	32 51.2	117 31.5	0	1472	
2016	20	4:50–6:15 p.m.	42$_{10}$	32 51.2	117 31.5	0	1472	
2017	S.N.1	6:30 p.m.	42$_{10}$	32 51.2	117 31.5	365–275	.....	
2018	S.N.1	6:57 p.m.	42$_{10}$	32 51.2	117 31.5	275–185	.....	
2019	S.N.1	7:19 p.m.	42$_{10}$	32 51.2	117 31.5	185 92	.....	
2020	S.N.1	7:35 p.m.	42$_{10}$	32 51.2	117 31.5	92–46	.....	
2021	S.N.1	7:47 p.m.	42$_{10}$	32 51.2	117 31.5	46–0	.....	
2022	S.N.1	8:00 p.m.	42$_{10}$	32 51.2	117 31.5	46 18	.....	
2023	S.N.1	8:08 p.m.	42$_{10}$	32 51.2	117 31.5	18–0	.....	
2024	000	6:25–8:22 p.m.	42$_{10}$	32 51.2	117 31.5	0	1473	
2025	12	6:25–8:22 p.m.	42$_{10}$	32 51.2	117 31.5	0	1473	
2026	20	6:25–8:22 p.m.	42$_{10}$	32 51.2	117 31.5	0	1473	
				March 15, 1910				
2027	L.N.1	1:32 p.m.	42$_{5}$	32 40.4	117 31.0	550–460	.....	
2028	000	1:12–1:50 p.m.	42$_{5}$	32 40.4	117 31.0	0	1483	
2029	12	1:12–1:50 p.m.	42$_{5}$	32 40.4	117 31.0	0	1483	
2030	20	1:12–1:50 p.m.	42$_{5}$	32 40.4	117 31.0	0	1483	
2031	L.N.1	2:01 p.m.	42$_{5}$	32 40.4	117 31.0	460 365	.....	Fog gathering
2032	L.N.1	2:28 p.m.	42$_{5}$	32 40.4	117 31.0	365 275	.....	and dispersing
2033	000	2:00–2:43 p.m.	42$_{5}$	32 40.4	117 31.0	0	1484	throughout the
2034	12	2:00–2:43 p.m.	42$_{5}$	32 40.4	117 31.0	0	1484	afternoon
2035	20	2:00–2:43 p.m.	42$_{5}$	32 40.4	117 31.0	0	1484	
2036	L.N.1	3:00 p.m.	42$_{5}$	32 40.4	117 31.0	275–185	.....	
2037	L.N.1	3:35 p.m.	42$_{5}$	32 40.4	117 31.0	185–137	.....	
2038	L.N.1	3:52 p.m.	42$_{5}$	32 40.4	117 31.0	137–92	.....	
2039	000	2:47–4:03 p.m.	42$_{5}$	32 40.4	117 31.0	0	1485	
2040	12	2:47–4:03 p.m.	42$_{5}$	32 40.4	117 31.0	0	1485	
2041	20	2:47 4:03 p.m.	42$_{5}$	32 40.4	117 31.0	0	1485	
2042	L.N.1	4:05 p.m.	42$_{5}$	32 40.4	117 31.0	92–46	.....	
2043	L.N.1	4:18 p.m.	42$_{5}$	32 40.4	117 31.0	46–18	.....	
2044	000	4:25 5:20 p.m.	42$_{5}$	32 40.4	117 31.0	0	1486	
2045	12	4:25–5:20 p.m.	42$_{5}$	32 40.4	117 31.0	0	1486	
2046	20	4:25–5:20 p.m.	42$_{5}$	32 40.4	117 31.0	0	1486	
2047	L.N.1	5:26 p.m.	42$_{5}$	32 40.4	117 31.0	46–18	.....	
				March 16, 1910				
2048	L.N.1	1:20 p.m.	42$_{5}$	32 39.2	117 27.0	550–460	.....	Struck bottom
2049	000	1:10 1:50 p.m.	41.5$_{5}$	1:00 to 1:50 drifted		0	1494	
2050	12	1:10 1:50 p.m.	51.5$_{5}$	from above to fol-		0	1494	
				lowing position				

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				March 16, 1910				
2051	20	1:10–1:50 p.m.	41.5_8	32° 40.5	117° 28.8	0	1494	
2052	L.N.1	2:41 p.m.	42_8	32 40.4	117 31.2	460–365	.....	Clear and bright,
2053	L.N.1	3:08 p.m.	42_8	32 40.4	117 31.2	365–275	.....	but windy and
2054	000	2:30–3:22 p.m.	42_8	32 40.4	117 31.2	0	1495	rough, making
2055	12	2:30–3:22 p.m.	42_8	32 40.4	117 31.2	0	1495	it difficult to
2056	20	2:30–3:22 p.m.	42_8	32 40.4	117 31.2	0	1495	handle the
2057	L.N.1	3:37 p.m.	42_8	32 40.4	117 31.2	275–185	.....	apparatus.
2058	L.N.1	3:55 p.m.	42_8	32 40.4	117 31.2	185–137	.....	Amount of
2059	L.N.1	4:08 p.m.	42_8	32 40.4	117 31.2	137–92	.....	drift unknown
2060	L.N.1	4:20 p.m.	42_8	32 40.4	117 31.2	92–46	.....	
2061	L.N.1	4:30 p.m.	42_8	32 40.4	117 31.2	46–9	.....	
2062	000	4:40–5:50 p.m.	42_8	32 40.4	117 31.2	0	.....	
2063	20	4:40–5:50 p.m.	42_8	32 40.4	117 31.2	0	.....	
2064	000	6:00–6:55 p.m.	42_8	32 40.4	117 31.2	0	.....	
2065	12	6:00–6:55 p.m.	42_8	32 40.4	117 31.2	0	.....	
2066	20	6:00–6:55 p.m.	42_8	32 40.4	117 31.2	0	.....	
				March 17, 1910				
2067	L.N.1	1:10 p.m.	42_{10}	32 50.0	117 30.0	550–460	.....	The afternoon
2068	L.N.1	1:37 p.m.	42_{10}	From 12:52 to 3:40		460–365	.....	was cloudy
2069	L.N.1	2:02 p.m.	42_{10}	p.m. the boat		365–275	.....	with a continu-
2070	000	1:30–2:18 p.m.	42_{10}	drifted from the		0	1509	ous drizzle from
2071	12	1:30–2:18 p.m.	42_{10}	above position		0	1509	2:40 to 4:40
2072	20	1:30–2:18 p.m.	42_{10}	to the following		0	1509	
2073	L.N.1	2:23 p.m.	42_{10}	position		275–185	.....	
2074	L.N.1	2:43 p.m.	42_{10}			185–137	.....	
2075	L.N.1	2:59 p.m.	42_{10}			137–92	.....	
2076	L.N.1	3:14 p.m.	42_{10}			92–46	.....	
2077	L.N.1	3:24 p.m.	42_{10}			46–18	.....	
2078	000	2:20–3:34 p.m.	42_{10}			0	1510	
2079	12	2:20–3:34 p.m.	42_{10}			0	1510	
2080	20	2:20–3:34 p.m.	42_{10}	32 50.6	117 29.2	0	1510	
2081	L.N.1	4:20 p.m.	42_{10}	32 50.6	117 29.2	550–460	.....	Drift unknown
2082	000	3:40–4:30 p.m.	42_{10}	32 50.6	117 29.2	0	1511	after 3:40 p.m.
2083	12	3:40–4:30 p.m.	42_{10}	32 50.6	117 29.2	0	1511	
2084	20	3:40–4:30 p.m.	42_{10}	32 50.6	117 29.2	0	1511	
2085	000	4:45–5:10 p.m.	42_{10}	32 50.6	117 29.2	0	1512	
2086	12	4:45–5:10 p.m.	42_{10}	32 50.6	117 29.2	0	1512	
2087	20	4:45–5:10 p.m.	42_{10}	32 50.6	117 29.2	0	1512	
2088	L.N.1	5:11 p.m.	42_{10}	32 50.6	117 29.2	460–0	.....	
2089	L.N.1	5:37 p.m.	42_{10}	32 50.6	117 29.2	460–365	.....	Twilight 5:40 to
2090	L.N.1	5:58 p.m.	42_{10}	32 50.6	117 29.2	365–275	.....	6:15 p.m., but
2091	000	5:30–6:10 p.m.	42_{10}	32 50.6	117 29.2	0	1513	dark on account
2092	12	5:30–6:10 p.m.	42_{10}	32 50.6	117 29.2	0	1513	of heavy clouds
2093	20	5:30–6:10 p.m.	42_{10}	32 50.6	117 29.2	0	1513	
2094	L.N.1	6:17 p.m.	42_{10}	32 50.6	117 29.2	275–185	.....	
2095	L.N.1	6:37 p.m.	42_{10}	32 50.6	117 29.2	185–137	.....	
2096	000	6:15–6:50 p.m.	42_{10}	32 50.6	117 29.2	0	1514	
2097	12	6:15–6:50 p.m.	42_{10}	32 50.6	117 29.2	0	1514	
2098	20	6:15–6:50 p.m.	42_{10}	32 50.6	117 29.2	0	1514	
2099	L.N.1	6:53 p.m.	42_{10}	32 50.6	117 29.2	137–92	.....	
2100	S.N.1	7:24 p.m.	42_{10}	32 50.6	117 29.2	92–46	.....	
2101	000	6:55–7:30 p.m.	42_{10}	32 50.6	117 29.2	0	1515	
2102	12	6:55–7:30 p.m.	42_{10}	32 50.6	117 29.2	0	1515	
2103	20	6:55–7:30 p.m.	42_{10}	32 50.6	117 29.2	0	1515	
2104	S.N.1	7:34 p.m.	42_{10}	32 50.6	117 29.2	46–18	.....	
				April 19, 1910				
2105	N.000	8:37 a.m.	40_5	32 23.5	117 20.0	92–46	.....	Rough and foggy
2106	N.000	8:54 a.m.	40_5	From 8:30 to 11:30		137–92	.....	at intervals
2107	N.000	9:09 a.m.	40_5	a.m. the boat		185–137	.....	Net bridle broken
2108	S.N.1	9:32 a.m.	40_5	drifted from the		275–185	.....	
2109	000	8:30–9:45 a.m.	40_5	above position		0	1522	
2110	12	8:30–9:45 a.m.	40_5	to the following		0	1522	
2111	20	8:30–9:45 a.m.	40_5	position		0	1522	
2112	S.N.1	9:55 a.m.	$40_{4.5}$			365–275	.....	

Table 5.—Data Relative to Plankton Hauls—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				April 19, 1910				
2113	S.N.1	10:28 a.m.	40_4			460–365		
2114	000	9:55–10:45 a.m.	40_4			0	1523	
2115	12	9:55–10:45 a.m.	40_4			0	1523	
2116	20	9:55–10:45 a.m.	40_4	32° 21.6	117° 17.4	0	1523	
				April 20, 1910				
2117	N.000	2:47 a.m.	40_5	32 23.3	117 20.0	46–0		Bright moonlight
2118	N.000	3:00 a.m.	40_5	32 23.0	117 19.9	92–46		till 3:00 a.m.
2119	N.000	3:15 a.m.	40_5	32 28.8	117 19.5	137–92		Dark but clear
2120	N.000	3:36 a.m.	40_5	32 22.6	117 19.5	185–137		3:00–4:20 a.m.
2121	N.000	3:59 a.m.	$40_{4.5}$	32 22.5	117 19.4	275–185		Twilight 4:20–
2122	N.000	4:33 a.m.	40_4	32 22.4	117 19.0	365–275		5:15 a.m.
2123	000	4:45–5:30 a.m.	40_4	32 22.3	117 19.0	0		Sunrise 5:15
2124	12	4:45–5:30 a.m.	40_4	32 22.3	117 19.0	0		a.m.
2125	20	4:45–5:30 a.m.	40_4	32 22.3	117 19.0	0		
2126	000	5:38–6:10 a.m.	40_4	32 21.4	117 18.0	0	1535	
2127	12	5:38–6:10 a.m.	40_4	32 21.4	117 18.0	0	1535	
2128	20	5:38–6:10 a.m.	40_4	32 21.4	117 18.0	0	1535	
				April 21, 1910				
2129	N.000	2:57 a.m.	41_5	32 23.5	117 23.2	46–0		Bright moonlight
2130	N.000	3:07 a.m.	41_5	32 23.5	117 22.8	92–46		until 3:20 a.m.
2131	N.000	3:21 a.m.	41_5	32 23.5	117 22.7	137–92		Dark until 4:30
2132	N.000	3:36 a.m.	41_5	32 23.5	117 22.6	185–137		a.m. Twilight
2133	N.000	3:54 a.m.	40.5_5	32 23.5	117 22.5	275–185		till sunrise at
2134	N.000	4:20 a.m.	40_5	32 23.5	117 22.4	365–275		5:15 a.m. Day
2135	N.000	4:47 a.m.	40_5	32 23.5	117 22.3	460–365		bright; ocean
2136	000	4:40–5:05 a.m.	40_5	32 23.5	117 22.3	0	1536	smooth
2137	12	4:40–5:05 a.m.	40_5	32 23.5	117 22.3	0	1536	
2138	20	4:40–5:05 a.m.	40_5	32 23.5	117 22.3	0	1536	
2139	N.000	5:19 a.m.	40_5	32 23.5	117 21.6	550–460		
2140	N.000	5:39 a.m.	40_5	From 5:15 to 7:07		46–0		
2141	N.000	6:12 a.m.	40_5	a.m. the boat		92–46		
2142	N.000	6:23 a.m.	40_5	drifted from the		137–92		
2143	N.000	6:35 a.m.	40_5	above position		185–137		
2144	N.000	6:50 a.m.	40_5	to the following		275–185		
2145	000	5:15–7:07 a.m.	40_5	position		0	1537	
2146	12	5:15–7:07 a.m.	40_5			0	1537	
2147	20	5:15–7:07 a.m.	40_5	32 23.5	117 20.0	0	1537	
2148	N.000	7:13 a.m.	40_5	32 23.5	117 20.0	365–275		
2149	N.000	7:36 a.m.	40_5	32 23.5	117 20.0	460–365		
2150	N.000	8:07 a.m.	40_5	32 23.5	117 20.0	550–460		
				August 13, 1910				
2151	20	11:35–11:49 a.m.	40_5	32 23.4	117 18.2	0	1567, 1568	
2152	12	11:35–11:49 a.m.	40_5	32 23.4	117 18.2	0	1567, 1568	
2153	000	11:35–11:49 a.m.	40_5	32 23.4	117 18.2	0	1567, 1568	
2154	S.N.1	11:59 a.m.	40_5	32 23.4	117 18.2	125–100		
2155	S.N.1	12:55 p.m.	40_5	32 23.4	117 18.2	100–75		
2156	S.N.1	1:06 p.m.	40_5	32 23.4	117 18.2	75–50		
2157	S.N.1	1:12 p.m.	40_5	32 23.4	117 18.2	50–25		
2158	S.N.1	1:17 p.m.	40_5	32 23.4	117 18.2	25–0		
2159	20	1:00–1:30 p.m.	40_5	32 23.4	117 18.2	0	1569, 1570	
2160	20	1:00–1:30 p.m.	40_5	32 23.4	117 18.2	0	1569, 1570	Same haul as 2159
2161	12	1:00–1:30 p.m.	40_5	32 23.4	117 18.2	0	1569, 1570	
2162	000	1:00–1:30 p.m.	40_5	32 23.4	117 18.2	0	1569, 1570	
2163	20	6:30–6:55 p.m.	40_5	32 23.4	117 21.9	0	1573	
2164	12	6:30–6:55 p.m.	40_5	32 23.4	117 21.9	0	1573	
2165	000	6:30–6:55 p.m.	40_5	32 23.4	117 21.9	0	1573	
				August 14, 1910				
2166	S.N.1	8:25 a.m.	40_5	32 23.4	117 18.2	150–100		
2167	S.N.1	8:35 a.m.	40_5	32 23.4	117 18.2	100–75		Drift unknown
2168	S.N.1	8:42 a.m.	40_5	32 23.4	117 18.2	75–50		
2169	S.N.1	8:47 a.m.	40_5	32 23.4	117 18.2	50–0		
2170	S.N.1	8:53 a.m.	40_5	32 23.4	117 18.2	50–25		
2171	S.N.1	8:59 a.m.	40_5	32 23.4	117 18.2	25–0		

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position		Depth in meters	Water sample number	Remarks
				N lat.	W long.			
				August 14, 1910				
2172	S.N.1	9:02 a.m.	40_5	32° 23.4	117° 18.2	25–0		
2174	20	8:42–9:22 a.m.	40_5	32 23.4	117 18.2	0	1576, 1577	
2175	12	8:42–9:22 a.m.	40_5	32 23.4	117 18.2	0	1576, 1577	
2176	000	8:42–9:22 a.m.	40_5	32 23.4	117 18.2	0	1576, 1577	
2177	20	10:22–10:42 a.m.	40_5	32 23.4	117 18.2	0	1579	
2178	12	10:22–10:42 a.m.	40_5	32 23.4	117 18.2	0	1579	Partly cloudy
2179	000	10:22–10:42 a.m.	40_5	32 23.4	117 18.2	0	1579	
2180	20	11:10–11:30 a.m.	40_5	32 23.4	117 18.2	0	1582	
2181	12	11:10–11:30 a.m.	40_5	32 23.4	117 18.2	0	1582	
2182	000	11:10–11:30 a.m.	40_5	32 23.4	117 18.2	0	1582	
2183	S.N.1	12:15 p.m.	40_5	32 23.4	117 18.2	550–0	.....	
2184	S.N.1	12:50 p.m.	40_5	32 23.4	117 18.2	550–0	.....	Net torn
2185	N.000	1:30 p.m.	40_5	32 23.4	117 18.2	300–200	.....	
2186	N.000	1:45 p.m.	40_5	32 23.4	117 18.2	200–100	.....	
2187	N.000	1:55 p.m.	40_5	32 23.4	117 18.2	100–75	.....	
2188	N.000	2:05 p.m.	40_5	32 23.4	117 18.2	75–50	.....	
2189	N.000	2:10 p.m.	40_5	32 23.4	117 18.2	50–25	.....	
2190	N.000	2:14 p.m.	40_5	32 23.4	117 18.2	25–0	.....	
2191	000	1:50–2:15 p.m.	40_5	32 23.4	117 18.2	0	1586	
2192	N.000	4:50 p.m.	41_5	32 23.4	117 24.2	800–350	.....	
2153	N.000	5:20 p.m.	41_5	32 23.4	117 24.2	350–125	.....	
2194	N.000	5:40 p.m.	41_5	32 23.4	117 24.2	125–50	.....	
2195	20	5:00–5:40 p.m.	41_5	32 23.4	117 24.2	0	1596	
2196	12	5:00–5:40 p.m.	41_5	32 23.4	117 24.2	0	1596	
				August 15, 1910				
2199	N.000	1:30 p.m.	40_{11}	32 52.8	117 19.0	250 150	.....	
2200	N.000	1:45 p.m.	40_{11}	32 52.8	117 19.0	150–75	.....	
2201	N.000	1:52 p.m.	40_{11}	32 52.8	117 19.0	75 50	.....	Bright and clear,
2202	N.000	2:00 p.m.	40_{11}	32 52.8	117 19.0	50–25	.....	sea smooth
2203	N.000	2:15 p.m.	40_{11}	32 52.8	117 19.0	25 0	.....	
2204	000	3:00–3:30 p.m.	40_{11}	32 52.8	117 19.0	0	1605	
2205	12	3:00–3:30 p.m.	40_{11}	32 52.8	117 19.0	0	1605	
2206	20	3:00–3:30 p.m.	40_{11}	32 52.8	117 19.0	0	1605	
				August 16, 1910				
2207	000c	10:15–10:50 a.m.	41_5	32 23.4	117 24.2	0	1606	Clear and calm
2208	12	10:15–10:50 a.m.	41_5	32 23.4	117 24.2	0	1606	
2209	20	10:15–10:50 a.m.	41_5	32 23.4	117 24.2	0	1606	
2210	N.000	5:30 p.m.	41_5	32 23.4	117 24.2	700–500	.....	
2212	N.000	5:55 p.m.	41_5	32 23.4	117 24.2	500–350	.....	Sunset 6:50 p.m.
2213	000c	5:29–6:10 p.m.	41_5	32 23.4	117 24.2	0	1618, 1619	Twilight ended
2214	12	5:29–6:10 p.m.	41_5	32 23.4	117 24.2	0	1618, 1619	7:07 p.m.
2215	20	5:29–6:10 p.m.	41_5	32 23.4	117 24.2	0	1618, 1619	Bright moon-
2216	N.000	6:30 p.m.	41_5	32 23.4	117 24.2	350–200	.....	light 8:05–9:35
2217	N.000	6:40 p.m.	41_5	32 23.4	117 24.2	200–125	.....	p.m.
2218	N.000	6:53 p.m.	41_5	32 23.4	117 24.2	125–50	.....	
2219	000c	6:20–6:54 p.m.	41_5	32 23.4	117 24.2	0	1619, 1620	
2220	12	6:20–6:54 p.m.	41_5	32 23.4	117 24.2	0	1619, 1620	
2221	20	6:20–6:54 p.m.	41_5	32 23.4	117 24.2	0	1619, 1620	
2222	N.000	7:02 p.m.	41_5	32 23.4	117 24.2	50–25	.....	
2223	N.000	7:10 p.m.	41_5	32 23.4	117 24.2	25–0	.....	
2224	000c	6:58–7:07 p.m.	41_5	32 23.4	117 24.2	0	1620	
2225	12	6:58–7:07 p.m.	41_5	32 23.4	117 24.2	0	1620	
2226	20	6:58–7:07 p.m.	41_5	32 23.4	117 24.2	0	1620	
2227	N.000	8:22 p.m.	40_5	32 23.4	117 21.9	700–500	.....	
2228	000c	8:05–8:30 p.m.	40_5	32 23.4	117 21.9	0	1621, 1622	
2229	12	8:05–8:30 p.m.	40_5	32 23.4	117 21.9	0	1621, 1622	
2230	20	8:05–8:30 p.m.	40_5	32 23.4	117 21.9	0	1621, 1622	
2231	N.000	8:53 p.m.	40_5	32 23.4	117 21.9	500–350	.....	
2232	N.000	9:18 p.m.	40_5	32 23.4	117 21.9	350–200	.....	
2233	N.000	9:33 p.m.	40_5	32 23.4	117 21.9	200–125	.....	
2234	N.000	9:45 p.m.	40_5	32 23.4	117 21.9	125–50	.....	
2237	N.000	9:54 p.m.	40_5	32 23.4	117 21.9	50–25	.....	
2236	N.000	9:59 p.m.	40_5	32 23.4	117 21.9	25–0	.....	

Table 5.—Data Relative to Plankton Hauls—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				August 17, 1910				
2237	N.000	11:37 a.m.	40_5	32° 23.4	117° 18.2	160–100	.....	
2238	N.000	11:48 a.m.	40_5	32 23.4	117 18.2	100–75	.....	Bright and clear
2239	N.000	11:56 a.m.	40_5	32 23.4	117 18.2	75–50	.....	
2240	N.000	12:05 p.m.	40_5	32 23.4	117 18.2	50–25	.....	
2241	N.000	12:08 p.m.	40_5	32 23.4	117 18.2	25–0	.....	
2242	000c	12:01–12:15 p.m.	40_5	32 23.4	117 18.2	0	1632	
2243	12	12:01–12:15 p.m.	40_5	32 23.4	117 18.2	0	1632	
2244	20	12:01–12:15 p.m.	40_5	32 23.4	117 18.2	0	1632	
2245	N.000	3:20 p.m.	40_5	32 23.4	117 21.9	550–350	.....	
2246	N.000	4:08 p.m.	40_5	32 23.4	117 21.9	350–200	.....	
2247	N.000	4:21 p.m.	40_5	32 23.4	117 21.9	200–125	.....	
2248	N.000	4:35 p.m.	40_5	32 23.4	117 21.9	125–50	.....	
2249	N.000	4:42 p.m.	40_5	32 23.4	117 21.9	50–25	.....	
2250	N.000	4:46 p.m.	40_5	32 23.4	117 21.9	25–0	.....	
2251	000c	4:27–4:48 p.m.	40_5	32 23.4	117 21.9	0	1650	
2252	12	4:27–4:48 p.m.	40_5	32 23.4	117 21.9	0	1650	
2253	20	4:27–4:48 p.m.	40_5	32 23.4	117 21.9	0	1650	
2254	N.000	6:24 p.m.	41_5	32 23.4	117 24.2	700–500	.....	
2255	000c	6:30–6:54 p.m.	41_5	32 23.4	117 24.2	0	1655, 1656	Sunset 6:41 p.m.
2256	12	6:30–6:54 p.m.	41_5	32 23.4	117 24.2	0	1655, 1656	Twilight ended
2257	20	6:30–6:54 p.m.	41_5	32 23.4	117 24.2	0	1655, 1656	7:06 p.m. Clear
2258	N.000	6:55 p.m.	41_5	32 23.4	117 24.2	500–350	.....	moonlight 7:30–
2259	000c	6:56–7:28 p.m.	41_5	32 23.4	117 24.2	0	1656, 1657	10:09 p.m.
2260	12	6:56–7:28 p.m.	41_5	32 23.4	117 24.2	0	1656, 1657	
2261	20	6:56–7:28 p.m.	41_5	32 23.4	117 24.2	0	1656, 1657	
2262	N.000	7:16 p.m.	41_5	32 23.4	117 24.2	350–200	.....	
2263	N.000	7:33 p.m.	41_5	32 23.4	117 24.2	200–125	.....	
2264	000c	7:30–7:56 p.m.	41_5	32 23.4	117 24.2	0	1657, 1658	
2265	12	7:30–7:56 p.m.	41_5	32 23.4	117 24.2	0	1657, 1658	
2266	20	7:30 7:56 p.m.	41_5	32 23.4	117 24.2	0	1657, 1658	
2267	N.000	7:50 p.m.	41_5	32 23.4	117 24.2	125–50	.....	
2268	N.000	7:57 p.m.	41_5	32 23.4	117 24.2	50–25	.....	
2269	N.000	8:35 p.m.	41_5	32 23.4	117 24.2	25–0	.....	
2270	N.000	9:02 p.m.	40_5	32 23.4	117 21.9	550–350	.....	
2271	000c	8:52–9:21 p.m.	40_5	32 23.4	117 21.9	0	1659	
2272	12	8:52–9:21 p.m.	40_5	32 23.4	117 21.9	0	1659	
2273	20	8:52–9:21 p.m.	40_5	32 23.4	117 21.9	0	1659	
2274	N.000	9:30 p.m.	40_5	32 23.4	117 21.9	350–225	.....	
2275	N.000	9:45 p.m.	40_5	32 23.4	117 21.9	225–125	.....	
2276	N.000	9:58 p.m.	40_5	32 23.4	117 21.9	125–50	.....	
2277	N.000	10:04 p.m.	40_5	32 23.4	117 21.9	50–25	.....	
2278	N.000	10:09 p.m.	40_5	32 23.4	117 21.9	25–0	.....	
				April 29, 1911				
2279	20	6:30–7:30 p.m.	B	32 43.1	117 11.4	0	.....	Hauls 2279–2288
				April 30, 1911				made from
2280	20	6:30–7:30 p.m.	B	32 43.1	117 11.4	0	.....	"Agassiz"
				May 1, 1911				while tied to
2281	20	6:30–7:30 p.m.	B	32 43.1	117 11.4	0	.....	mooring
				May 2, 1911				
2282	20	6:30–8:00 p.m.	B	32 43.1	117 11.4	0	.....	
				May 3, 1911				
2283	20	6:30–8:00 p.m.	B	32 43.1	117 11.4	0	.....	
				May 4, 1911				
2284	20	6:30–8:00 p.m.	B	32 43.1	117 11.4	0	.....	
				May 5, 1911				
2285	20	6:30–8:00 p.m.	B	32 43.1	117 11.4	0	.....	
				May 6, 1911				
2286	20	6:30–8:00 p.m.	B	32 43.1	117 11.4	0	.....	
				May 7, 1911				
2287	20	6:30–8:00 p.m.	B	32 43.1	117 11.4	0	.....	
				May 8, 1911				
2288	20	6:30–8:00 p.m.	B	32 43.1	117 11.4	0	.....	
				June 14, 1911				
2289	000c	3:00–4:00 a.m.	40_5	32 22.4	117 21.2	0	1728	

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				June 14, 1911				
2290	12	3:00–4:00 a.m.	40_4	From 2:14 to 5:15		0	1728	
2291	20	3:00–4:00 a.m.	40_4	a.m. boat drifted		0	1728	
2292	N.0	5:07 a.m.	40_4	from above position to following position		137–0	.....	See hydrographic data for water samples corresponding to N.0 hauls, one sample usually being taken from each depth before and after each Nansen series
2293	N.0	5:20 a.m.	40_4	32° 22.2	117° 21.6	137–92	.....	
2294	N.0	5:35 a.m.	40_4	32 22.2	117 21.6	92–73	.....	
2295	000c	5:00–5:40 a.m.	40_4	32 22.2	117 21.6	0	1733	
2296	12	5:00–5:40 a.m.	40_4	32 22.2	117 21.6	0	1733	
2297	20	5:00–5:40 a.m.	40_4	32 22.2	117 21.6	0	1733	
2298	N.0	5:50 a.m.	40_4	32 22.4	117 21.2	73–55	.....	
2299	N.0	6:12 a.m.	40_4	From 5:50 to 7:55		55–46	.....	
2300	N.0	6:20 a.m.	40_4	a.m. the boat		46–37	.....	
2301	N.0	6:27 a.m.	40_4	drifted from the		37–27	....	
2302	N.0	6:30 a.m.	40_4	above position		27–18	.....	
2303	N.0	6:35 a.m.	40_4	to the following		9–0	.....	Day bright and clear
2304	N.0	6:50 a.m.	40_5	position		137–92	.....	
2305	N.0	7:00 a.m.	40_4			92–73	....	
2306	N.0	7:07 a.m.	40_4			73–55	. ...	
2307	N.0	7:15 a.m.	40_4			55–46	... .	
2308	N.0	7:25 a.m.	40_4			46–37	. ...	
2309	N.0	7:32 a.m.	40_4			37–27	....	
2310	N.0	7:40 a.m.	40_4			27–18	.....	
2311	N.0	7:46 a.m.	40_4			18–9	....	
2312	N.0	7:50 a.m.	40_4			9–0	....	
2313	000c	6:05–7:55 a.m.	40_4			0	1734	
2314	12	6:05–7:55 a.m.	40_4			0	1734	
2315	20	6:05–7:55 a.m.	40_4	32 22.1	117 21.5	0	1734	
2316	000c	9:55–10:55 a.m.	40_4	32 22.4	117 21.2	0	1751, 1761	
2317	12	9:55–10:55 a.m.	40_4	From 10:00 to 11:59		0	1751, 1761	
2318	20	9:55–10:55 a.m.	40_4	a.m. the boat		0	1751, 1761	
2319	N.0	11:05 a.m.	40_4	drifted from the		137–92	....	
2320	N.0	11:20 a.m.	40_4	above position		92–73	....	
2321	N.0	11:27 a.m.	40_4	to the following		73–55	. .....	
2322	N.0	11:34 a.m.	40_4	position		55–46	....	
2323	N.0	11:40 a.m.	40_4			46–37	.....	
2324	N.0	11:44 a.m.	40_4			37–27	.....	
2325	N.0	11:48 a.m.	40_4			27–18	....	
2326	N.0	11:54 a.m.	40_4			18–9	....	
2327	N.0	11:58 a.m.	40_4			9–0	....	
2328	000c	10:59–11:59 a.m.	40_4			0	1761, 1762	
2329	12	10:59–11:59 a.m.	40_4			0	1761, 1762	
2330	20	10:59–11:59 a.m.	40_4	32 22.0	117 20.4	0	1761, 1762	
				June 15, 1911				
2331	000c	1:30–2:20 a.m.	40_5	32 22.7	117 19.2	0	1763, 1772	Dark and foggy
2332	12	1:30–2:20 a.m.	40_5	From 1:30 to 4:10		0	1763, 1772	
2333	20	1:30–2:20 a.m.	40_5	a.m. the boat		0	1763, 1772	
2334	N.0	2:23 a.m.	40_5	drifted from the		137–92	.....	
2335	N.0	2:35 a.m.	40_5	above position		92–73	....	
2336	N.0	2:43 a.m.	40_5	to the following		73–55	.....	
2337	N.0	2:54 a.m.	40_5	position		55–46	....	
2338	N.0	2:58 a.m.	40_5			46–37	....	
2339	N.0	3:02 a.m.	40_5			37–27	....	
2340	N.0	3:07 a.m.	40_5			27–18	.....	
2341	N.0	3:10 a.m.	40_5			18–9	.....	
2342	N.0	3:12 a.m.	40_5			9–0	.....	
2343	000c	2:25–3:25 a.m.	40_5			0	1772, 1776	
2344	12	2:25–3:25 a.m.	40_5			0	1772, 1776	
2345	20	2:25–3:25 a.m.	40_5	32 23.6	117 18.5	0	1772, 1776	
2346	000c	4:23–5:07 a.m.	40_5	32 22.7	117 19.2	0	1785, 1794	Partly cloudy

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				June 15, 1911				
2347	12	4:23–5:07 a.m.	40$_5$	From 4:20 to 6:25		0	1785, 1794	
2348	20	4:23–5:07 a.m.	40$_5$	a.m. the boat		0	1785, 1794	
2349	N.0	5:03 a.m.	40$_5$	drifted from the		137–92	.....	
2350	N.0	5:10 a.m.	40$_5$	above position		92–73	.....	
2351	000e	5:10–6:25 a.m.	40$_5$	to the following		0	1794, 1807	
2352	12	5:10–6:25 a.m.	40$_5$	position		0	1794, 1807	
2353	20	5:10–6:25 a.m.	40$_5$			0	1794, 1807	
2354	N.0	5:20 a.m.	40$_5$			73–55	.....	
2355	N.0	5:26 a.m.	40$_5$			55–46	.....	
2356	N.0	5:30 a.m.	40$_5$			46–37	.....	
2357	N.0	5:35 a.m.	40$_5$			37–27	.....	
2358	N.0	5:39 a.m.	40$_5$			27–18	.....	
2359	N.0	5:42 a.m.	40$_5$			18–9	.....	
2360	N.0	5:45 a.m.	40$_5$	32° 23.5	117° 18.9	9–0	.....	
2361	000e	7:05–8:05 a.m.	40$_5$	32 22.7	117 19.2	0	1808, 1817	For water samples
2362	12	7:05–8:05 a.m.	40$_5$	From 7:05 to 9:25		0	1808, 1817	corresponding
2363	20	7:05–8:05 a.m.	40$_5$	a.m. the boat		0	1808, 1817	to N.0 hauls
2364	N.0	8:10 a.m.	40$_5$	drifted from the		137–92	.....	see p. 171
2365	000e	8:20–9:25 a.m.	40$_5$	above position		0	1818, 1827	
2366	12	8:20–9:25 a.m.	40$_5$	to the following		0	1818, 1827	
2367	20	8:20–9:25 a.m.	40$_5$	position		0	1818, 1827	
2368	N.0	8:20 a.m.	40$_5$			92–73	.....	
2369	N.0	8:27 a.m.	40$_5$			73–55	.....	
2370	N.0	8:40 a.m.	40$_5$			55–46	.....	
2371	N.0	8:45 a.m.	40$_5$			46–37	.....	
2372	N.0	8:47 a.m.	40$_5$			37–27	.....	
2373	N.0	8:54 a.m.	40$_5$			27–18	.....	
2374	N.0	8:58 a.m.	40$_5$			18–9	.....	
2375	N.0	9:01 a.m.	40$_5$	32 23.3	117 18.6	9–0	.....	
				June 16, 1911				
2376	000e	1:50–2:30 a.m.	40$_5$	32 23.5	117 18.0	0	1863, 1873	
2377	12	1:50–2:30 a.m.	40$_5$	From 1:48 to 3:45		0	1863, 1873	
2378	20	1:50–2:30 a.m.	40$_5$	a.m. the boat		0	1863, 1873	
2379	N.0	2:35 a.m.	40$_5$	drifted from the		137–92	.....	
2380	000e	2:45–3:45 a.m.	39.5$_5$	above position		0	1874, 1885	
2381	12	2:45–3:45 a.m.	39.5$_5$	to the following		0	1874, 1885	
2382	20	2:45–3:45 a.m.	39.5$_5$	position		0	1874, 1885	
2383	N.0	2:45 a.m.	40$_5$			92–73	.....	Dark and cloudy
2384	N.0	2:52 a.m.	39.5$_5$			73–55	.....	
2385	N.0	2:59 a.m.	39$_5$			55–46	.....	
2386	N.0	3:04 a.m.	39$_5$			46–37	.....	
2387	N.0	3:08 a.m.	39$_5$			37–27	.....	
2388	N.0	3:11 a.m.	39$_5$			27–18	.....	
2389	N.0	3:16 a.m.	39$_5$			18–9	.....	
2390	N.0	3:20 a.m.	39$_5$	32 22.7	117 17.1	9–0	.....	
2391	000e	4:15–4:45 a.m.	40$_5$	32 23.5	117 18.0	0	1889, 1896	
2392	12	4:15–4:45 a.m.	40$_5$	From 4:12 to 6:20		0	1889, 1896	
2393	20	4:15–4:45 a.m.	40$_5$	a.m. the boat		0	1889, 1896	
2394	N.0	4:45 a.m.	40$_5$	drifted from the		137–92	.....	
2395	000e	4:50–5:45 a.m.	40$_5$	above position		0	1896, 1900	
2396	12	4:50–5:45 a.m.	40$_5$	to the following		0	1896, 1900	
2397	20	4:50–5:45 a.m.	40$_5$	position		0	1896, 1900	
2399	N.0	5:00 a.m.	40$_5$			92–73	.....	
2400	N.0	5:05 a.m.	40$_5$			73–55	.....	
2401	N.0	5:10 a.m.	40$_5$			55–46	.....	
2402	N.0	5:15 a.m.	40$_5$			46–37	.....	
2403	N.0	5:20 a.m.	40$_5$			37–27	.....	
2404	N.0	5:30 a.m.	40$_5$			27–18	.....	
2405	N.0	5:33 a.m.	40$_5$			18–9	.....	
2406	N.0	5:35 a.m.	40$_5$			9–0	.....	
2407	000e	5:55–6:20 a.m.	40$_5$			0	1900, 1907	
2408	12	5:55–6:20 a.m.	40$_5$			0	1900, 1907	
2409	20	5:55–6:20 a.m.	40$_5$	32 23.2	117 17.5	0	1900, 1907	
2410	000e	6:45–7:30 a.m.	40$_5$	32 23.5	117 18.0	0	.....	

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				June 16, 1911				
2411	12	6:45–7:30 a.m.	40.5	From 6:45 to 9:43		0		
2412	20	6:45–7:30 a.m.	40.5	a.m. the boat		0		
2413	12	7:48–8:20 a.m.	40.5	drifted from the		0	1911	
2414	20	7:48–8:20 a.m.	40.5	above position		0	1911	
2415	000e	8:25–9:43 a.m.	39.5	to the following		0	1918, 1928	
2416	12	8:25–9:43 a.m.	39.5	position		0	1918, 1928	
2417	20	8:25–9:43 a.m.	39.5			0	1918, 1928	
2418	N.0	8:40 a.m.	40			137–92		
2419	N.0	8:45 a.m.	40			92–73		For water samples
2420	N.0	8:52 a.m.	40			73–55		corresponding
2421	N.0	8:55 a.m.	40			55–46		to N.0 hauls
2422	N.0	9:05 a.m.	40			46–37		see p. 171
2423	N.0	9:07 a.m.	40			37–27		
2424	N.0	9:15 a.m.	39.5			27–18		
2425	N.0	9:17 a.m.	39			18–9		
2426	N.0	9:18 a.m.	39	32° 23′0	117° 17′4	9–0		
				June 17, 1911				
2427	000e	1:45–2:25 a.m.	40	32 21.6	117 21.5	0	1974, 1981	
2428	12	1:45–2:25 a.m.	40	From 1:30 to 3:55		0	1974, 1981	
2429	20	1:45–2:25 a.m.	40	a.m. the boat		0	1974, 1981	
2430	N.0	2:30 a.m.	40	drifted from the		137–92		
2431	000e	2:30–4:00 a.m.	40	above position		0	1981, 1994	
2432	12	2:30–4:00 a.m.	40	to the following		0	1981, 1994	
2433	20	2:30–4:00 a.m.	40	position		0	1981, 1994	
2434	N.0	2:40 a.m.	40			92–73		
2435	N.0	2:47 a.m.	40			73–55		
2436	N.0	2:55 a.m.	40			55–46		
2437	N.0	3:00 a.m.	40			46–37		
2438	N.0	3:07 a.m.	40			37–27		
2439	N.0	3:11 a.m.	40			27–18		
2440	N.0	3:15 a.m.	40			18–9		
2441	N.0	3:20 a.m.	40	32 20.7	117 20.0	9–0		
2442	000e	4:35–5:00 a.m.	40	32 22.4	117 21.2	0	1997, 2004	
2443	12	4:35–5:00 a.m.	40	From 4:30 to 6:10		0	1997, 2004	
2444	20	4:35–5:00 a.m.	40	a.m. the boat		0	1997, 2004	
2445	N.0	5:04 a.m.	40	drifted from the		137–92		
2446	000e	5:05–6:10 a.m.	40	above position		0	2004, 2014	
2447	12	5:05–6:10 a.m.	40	to the following		0	2004, 2014	
2448	20	5:05–6:10 a.m.	40	position		0	2004, 2014	
2449	N.0	5:12 a.m.	40			92–73		
2450	N.0	5:30 a.m.	40			73–55		
2451	N.0	5:35 a.m.	40			55–46		
2452	N.0	5:38 a.m.	40			46–37		
2453	N.0	5:42 a.m.	40			37–27		
2454	N.0	5:46 a.m.	40			27–18		
2455	N.0	5:49 a.m.	40			18–9		
2456	N.0	5:52 a.m.	40	32 21.0	117 20.2	9–0		
2457	000e	6:55–7:38 a.m.	40	32 22.4	117 21.2	0	2015, 2025	
2458	12	6:55–7:38 a.m.	40	From 6:55 to 8:45		0	2015, 2025	
2459	20	6:55–7:38 a.m.	40	a.m. the boat		0	2015, 2025	
2460	N.0	7:42 a.m.	40	drifted from the		137–92		
2461	000e	7:45–8:30 a.m.	40	above position		0	2026	
2462	12	7:45–8:30 a.m.	40	to the following		0	2026	
2463	20	7:45–8:30 a.m.	40	position		0	2026	
2464	N.0	7:50 a.m.	40			92–73		
2465	N.0	8:00 a.m.	40			73–55		
2466	N.0	8:04 a.m.	40			55–46		
2467	N.0	8:10 a.m.	40			46–37		
2468	N.0	8:18 a.m.	40			37–27		
2470	N.0	8:20 a.m.	40			27–18		
2471	N.0	8:22 a.m.	40			18–9		
2472	N.0	8:25 a.m.	40	32 21.4	117 20.2	9–0		
2473	000e	8:55–10:00 a.m.	40	32 22.4	117 19.9	0	2036	
2474	12	8:55–10:00 a.m.	40	32 22.4	117 19.9	0	2036	
2475	20	8:55–10:00 a.m.	40	32 22.4	117 19.9	0	2036	

Table 5.—Data Relative to Plankton Hauls—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				June 18, 1911				
2476	000c	2:00–2:35 a.m.	40$_5$	32° 22.7	117° 19.2	0	2049, 2056	For water samples
2477	12	2:00–2:35 a.m.	40$_5$	From 2:00 to 3:55		0	2049, 2056	corresponding
2478	20	2:00–2:35 a.m.	40$_5$	a.m. the boat		0	2049, 2056	to N.0 hauls
2479	000c	2:40–3:35 a.m.	40$_4$	drifted from the		0	2056, 2063	see p. 171
2480	12	2:40–3:35 a.m.	40$_4$	above position		0	2056, 2063	
2481	20	2:40–3:35 a.m.	40$_4$	to the following		0	2056, 2063	
2482	N.0	2:55 a.m.	40$_4$	position		137–92	.....	Dark and cloudy
2483	N.0	3:02 a.m.	40$_4$			92–73	.....	until beginning
2484	N.0	3:10 a.m.	40$_4$			73–55	.....	of twilight at
2485	N.0	3:15 a.m.	40$_4$			55–46	.....	3:42 a.m.
2486	N.0	3:20 a.m.	40$_4$			46–37	.....	
2487	N.0	3:22 a.m.	40$_4$			37–27	.....	
2488	N.0	3:25 a.m.	40$_4$			27–18	.....	
2489	N.0	3:30 a.m.	40$_4$			18–9	.....	
2490	N.0	3:32 a.m.	40$_4$			9–0	.....	
2491	000c	3:40–3:55 a.m.	40$_4$			0	2063	
2492	12	3:40–3:55 a.m.	40$_4$			0	2063	
2493	20	3:40–3:55 a.m.	40$_4$	32 22.2	117 18.8	0	2063	
2494	000c	4:05–4:35 a.m.	40$_5$	32 22.7	117 19.2	0	2070, 2077	
2495	12	4:05–4:35 a.m.	40$_5$	From 4:05 to 5:45		0	2070, 2077	
2496	20	4:05–4:35 a.m.	40$_5$	a.m. the boat		0	2070, 2077	
2497	000c	4:38–5:45 a.m.	40$_4$	drifted from the		0	2077, 2084	
2498	12	4:38–5:45 a.m.	40$_4$	above position		0	2077, 2084	
2499	20	4:38–5:45 a.m.	40$_4$	to the following		0	2077, 2084	
2500	N.0	4:40 a.m.	40$_4$	position		137–92	.....	
2501	N.0	4:50 a.m.	40$_4$			92–73	.....	
2502	N.0	5:00 a.m.	40$_4$			73–55	.....	
2503	N.0	5:05 a.m.	40$_4$			55–46	.....	
2504	N.0	5:10 a.m.	40$_4$			46–37	.....	
2505	N.0	5:13 a.m.	40$_4$			37–0	.....	
2506	N.0	5:17 a.m.	40$_4$			37–27	.....	
2507	N.0	5:20 a.m.	40$_4$			27–18	.....	
2508	N.0	5:23 a.m.	40$_4$			18–9	.....	
2509	.....	.....	40$_4$			0	.....	Dip-net haul
2510	N.0	5:25 a.m.	40$_4$	32 22.2	117 18.8	9–0	.....	
2511	000c	6:25–7:30 a.m.	40$_5$	32 22.7	117 19.2	0	2097, 2104	
2512	12	6:25–7:30 a.m.	40$_5$	From 6:00 to 7:30		0	2097, 2104	At 6:30 a.m. a
2513	20	6:25–7:30 a.m.	40$_5$	a.m. the boat		0	2097, 2104	heavy mist,
2514	N.0	6:30 a.m.	40$_5$	drifted from the		137–92	.....	almost a drizzle,
2515	N.0	6:38 a.m.	40$_5$	above position		92–73	.....	commenced
2516	N.0	6:45 a.m.	40$_5$	to the following		73–55	.....	
2517	N.0	6:50 a.m.	40$_5$	position		55–46	.....	
2518	N.0	6:55 a.m.	40$_5$			46–37	.....	
2519	N.0	7:00 a.m.	40$_5$			37–27	.....	
2520	N.0	7:04 a.m.	40$_5$			27–18	.....	
2521	N.0	7:08 a.m.	40$_5$			18–9	.....	
2522	N.0	7:10 a.m.	40$_5$	32 22.8	117 18.8	9–0	.....	
				June 20, 1911				
2523	000c	4:35–5:15 a.m.	40$_5$	32 23.5	117 18.0	0	2105, 2114	Twilight well
2524	12	4:35–5:15 a.m.	40$_5$	From 4:35 to 6:40		0	2105, 2114	advanced at
2525	20	4:35–5:15 a.m.	40$_5$	a.m. the boat		0	2105, 2114	4:35 a.m.
2526	000c	5:20–6:05 a.m.	39.5$_5$	drifted from the		0	2114, 2119	
2527	12	5:20–6:05 a.m.	39.5$_5$	above position		0	2114, 2119	
2528	20	5:20–6:05 a.m.	39.5$_5$	to the following		0	2114, 2119	
2529	N.0	5:20 a.m.	40$_5$	position		137–92	.....	
2530	N.0	5:30 a.m.	40$_5$			92–73	.....	
2531	N.0	5:37 a.m.	40$_5$			73–55	.....	
2532	N.0	5:42 a.m.	40$_5$			55–46	.....	
2533	N.0	5:48 a.m.	40$_5$			46–37	.....	
2534	N.0	5:52 a.m.	40$_5$			37–27	.....	
2535	N.0	5:55 a.m.	39$_5$			27–18	.....	
2536	N.0	5:58 a.m.	39$_5$			18–9	.....	
2537	N.0	6:00 a.m.	39$_5$			9–0	.....	
2538	N.0	6:05 a.m.	39$_5$			92–0	.....	

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				June 18, 1911				
2539	000c	6:10–6:40 a.m.	39$_5$			0	2119	
2540	12	6:10–6:40 a.m.	39$_5$			0	2119	
2541	20	6:10–6:40 a.m.	39$_5$	32 23.0	117 17.2	0	2119	
2542	000c	7:05–7:30 a.m.	40$_5$	32 23.5	117 18.0	0	2128	
2543	12	7:05–7:30 a.m.	40$_5$	From 7:05 to 9:35		0	2128	
2544	20	7:05–7:30 a.m.	40$_5$	a.m. the boat		0	2128	
2545	000c	7:45–9:40 a.m.	39.5$_5$	drifted from the		0	2133, 2146	
2546	12	7:45–9:40 a.m.	39.5$_5$	above position		0	2133, 2146	
2547	20	7:45–9:40 a.m.	39.5$_5$	to the following		0	2133, 2146	
2548	N.0	8:05 a.m.	40	position		137–92		
2549	N.0	8:15 a.m.	40			92–73		
2550	N.0	8:25 a.m.	39			73–55		For water samples
2551	N.0	8:35 a.m.	39$_5$			55–46		corresponding
2552	N.0	8:42 a.m.	39$_5$			46–37		to N.0 hauls
2553	N.0	8:45 a.m.	39$_5$			37–27		see p. 171
2554	N.0	8:50 a.m.	39$_5$			27–18		
2555	N.0	8:52 a.m.	39$_5$			18–9		
2556	N.0	8:55 a.m.	39$_5$	32 23.6	117 17.0	9–0		
2557	000c	10:15–10:40 a.m.	39$_5$	32 20.0	117 17.4	0	2147, 2148	
2558	12	10:15–10:40 a.m.	39$_5$	32 20.0	117 17.4	0	2147, 2148	
2559	20	10:15–10:40 a.m.	39$_5$	32 20.0	117 17.4	0	2147, 2148	
2560	N.0	10:20 a.m.	39$_5$	32 20.0	117 17.4	92–73		
2561	N.0	10:30 a.m.	39$_5$	32 20.0	117 17.4	73–55		
2562	N.0	10:35 a.m.	39$_5$	32 20.0	117 17.4	55–46		
2563	N.0	10:40 a.m.	39$_5$	32 20.0	117 17.4	46–0		
				June 21, 1911				
2564	000c	5:00–7:00 a.m.	40$_{1.5}$	32 22.4	117 21.2	0	2149, 2150	
2565	12	5:00–7:00 a.m.	40$_{1.5}$	4:35 to 7:20 a.m.		0	2149, 2150	
2566	20	5:00–7:00 a.m.	40$_{1.5}$	boat drifted from		0	2149, 2150	
2567	N.0	5:05 a.m.	40$_5$	above to follow-		1190–820		
2568	N.0	6:25 a.m.	40$_5$	ing position		820–460		
2569	N.0	7:19 a.m.	40$_5$	32 23.6	117 20.9	460–137		
2570	.....	8:20 a.m.	40$_5$	32 22.4	117 21.2	1290	2151	Mud haul made with the Ekman water bottle
				June 22, 1911				
2571	000c	5:35–5:50 a.m.	42$_5$	32 40.0	117 32.0	0	2189, 2194	
2572	20	5:35–5:50 a.m.	42$_5$	32 40.0	117 32.0	0	2189, 2194	
2573	000c	6:00–7:18 a.m.	42$_5$	32 40.0	117 32.0	0	2194, 2205	
2574	12	6:00–7:18 a.m.	42$_5$	32 40.0	117 32.0	0	2194, 2205	
2575	20	6:00–7:18 a.m.	42$_5$	32 40.0	117 32.0	0	2194, 2205	
2576	N.0	6:00 a.m.	42$_5$	32 40.0	117 32.0	137–92		
2577	N.0	6:11 a.m.	42$_5$	32 40.0	117 32.0	92–0		
2578	.....	.....	42$_5$	32 40.0	117 32.0	0	.....	Dip-net haul
2579	N.0	6:20 a.m.	42$_5$	32 40.0	117 32.0	92–73		
2580	N.0	6:30 a.m.	42$_5$	32 40.0	117 32.0	73–55		
2581	.....	.....	42$_5$	32 40.0	117 32.0	0		Dip-net haul
2582	N.0	6:40 a.m.	42$_5$	32 40.0	117 32.0	55–46		
2583	N.0	6:44 a.m.	42$_5$	32 40.0	117 32.0	46–37		
2584	N.0	6:47 a.m.	42$_5$	32 40.0	117 32.0	37–27		
2585	N.0	6:52 a.m.	42$_5$	32 40.0	117 32.0	27–18		
2586	N.0	6:57 a.m.	42$_5$	32 40.0	117 32.0	18–9		
2587	N.0	6:59 a.m.	42$_5$	32 40.0	117 32.0	9–0		
2588	000c	9:20–10:00 a.m.	42$_{10}$	32 52.0	117 30.0	0	2213	
2589	12	9:20–10:00 a.m.	42$_{10}$	32 52.0	117 30.0	0	2213	
2590	20	9:20–10:00 a.m.	42$_{10}$	32 52.0	117 30.0	0	2213	
2591	N.0	9:45 a.m.	42$_{10}$	32 52.0	117 30.0	137–92		
2592	N.0	9:52 a.m.	42$_{10}$	32 52.0	117 30.0	92–0		
2593	N.0	10:00 a.m.	42$_{10}$	32 52.0	117 30.0	92–73		
				June 24, 1911				
2594	000c	3:45–4:30 p.m.	52$_{10}$	32 50.0	118 20.3	0	2359, 2360	
2595	12	3:45–4:30 p.m.	52$_{10}$	32 50.0	118 20.3	0	2359, 2360	
2596	20	3:45–4:30 p.m.	52$_{10}$	32 50.0	118 20.3	0	2359, 2360	
2597	N.0	3:47 p.m.	52$_{10}$	32 50.0	118 20.3	137–92		Bright and clear
2598	N.0	3:56 p.m.	52$_{10}$	32 50.0	118 20.3	92–73		
2599	N.0	4:04 p.m.	52$_{10}$	32 50.0	118 20.3	73–55		

Table 5.—Data Relative to Plankton Hauls—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				June 24, 1911				
2600	.....	.....	52_{10}	32° 50.0	118° 20.3	0	.....	Dip-net haul
2601	N.0	4:12 p.m.	52_{10}	32 50.0	118 20.3	55–46	.....	
2602	N.0	4:15 p.m.	52_{10}	32 50.0	118 20.3	46–37	.....	
2603	N.0	4:20 p.m.	52_{10}	32 50.0	118 20.3	37–27	.....	
2604	N.0	4:25 p.m.	52_{10}	32 50.0	118 20.3	27–18	.....	
2605	N.0	4:27 p.m.	52_{10}	32 50.0	118 20.3	18–9	.....	
2606	N.0	4:30 p.m.	52_{10}	32 50.0	118 20.3	9–0	.....	
				June 26, 1911				
2607	000e	4:00–5:10 a.m.	40_{15}	32 22.7	117 19.2	0	2361	Beginning of twilight 3:52 a.m.
2608	12	4:00–5:10 a.m.	40_{15}	From 3:52 to 5:10		0	2361	
2609	20	4:00–5:10 a.m.	40_{15}	a.m. the boat		0	2361	
2610	N.0	4:01 a.m.	40_{5}	drifted from the		137–92	.....	For water samples
2611	N.0	4:16 a.m.	40_{5}	above position		92–73	.....	corresponding
2612	N.0	4:25 a.m.	40_{5}	to the following		73–55	.....	to N.0 hauls
2613	N.0	4:34 a.m.	40_{15}	position		55–0	.....	see p. 171
2614	N.0	4:40 a.m.	40_{4}			55–46	.....	
2615	N.0	4:47 a.m.	40_{4}			46–37	.....	
2616	N.0	4:53 a.m.	40_{4}			37–27	.....	
2617	N.0	4:58 a.m.	40_{4}			27–18	.....	
2618	N.0	5:02 a.m.	40_{4}			18–9	.....	
2619	N.0	5:07 a.m.	40_{4}	32 22.1	117 18.5	9–0	.....	
2620	000e	5:45–6:45 a.m.	40_{5}	32 22.7	117 19.2	0	2364, 2365	
2621	12	5:45–6:45 a.m.	40_{5}	32 22.7	117 19.2	0	2364, 2365	
2622	20	5:45–6:45 a.m.	40_{5}	32 22.7	117 19.2	0	2364, 2365	
2623	000e	7:35–8:50 a.m.	40_{4}	32 22.4	117 21.2	0	2366, 2367	
2624	12	7:35–8:50 a.m.	40_{4}	From 7:30 to 8:50		0	2366, 2367	
2625	20	7:35–8:50 a.m.	40_{4}	a.m. the boat		0	2366, 2367	
2626	N.0	7:40 a.m.	40_{4}	drifted from the		137–92	.....	
2627	N.0	7:55 a.m.	40_{4}	above position		92–73	.....	
2628	N.0	8:03 a.m.	40_{4}	to the following		73–55	.....	
2629	N.0	8:09 a.m.	40_{4}	position		55–46	.....	
2630	N.0	8:15 a.m.	40_{4}			46–37	.....	
2631	N.0	8:20 a.m.	40_{4}			37–27	.....	
2632	N.0	8:30 a.m.	40_{4}			27–18	.....	
2633	N.0	8:32 a.m.	40_{4}			18–9	.....	
2634	N.0	8:35 a.m.	40_{4}	32 21.8	117 20.5	9–0	.....	
2635	.....	.....	40_{4}	.....	.....	0	.....	Dip-net haul
				August 8, 1911				
2637	N.0	3:50 a.m.	40_{5}	32 23.5	117 18.0	92–73	.....	Very dark until
2638	N.0	4:03 a.m.	40_{5}	From 3:35 to 4:22		73–55	.....	beginning of
2639	000e	4:05–5:05 a.m.	40_{15}	a.m. boat drifted		0	2621	twilight at 4:20
2640	12	4:05–5:05 a.m.	40_{15}	from above posi-		0	2621	a.m. Sun hidden
2641	20	4:05–5:05 a.m.	40_{15}	tion to follow-		0	2621	from 5:20 to
2642	N.0	4:15 a.m.	40_{15}	ing position		55–46	.....	7:55 a.m., after
2643	N.0	4:22 a.m.	40_{5}	32 22.3	117 17.9	46–37	.....	which it was
2644	N.0	4:55 a.m.	40_{4}	32 22.3	117 17.9	37–27	.....	bright and clear
2645	000e	5:10–5:25 a.m.	40_{4}	32 22.3	117 17.9	0	2622	
2646	12	5:10–5:25 a.m.	40_{4}	32 22.3	117 17.9	0	2622	
2647	20	5:10–5:25 a.m.	40_{4}	32 22.3	117 17.9	0	2622	
2648	N.0	5:18 a.m.	40_{4}	32 22.3	117 17.9	27–18	.....	
2649	N.0	5:23 a.m.	40_{4}	32 22.3	117 17.9	18–9	.....	
2650	N.0	5:30 a.m.	40_{4}	32 22.3	117 17.9	9–0	.....	
2651	000e	6:05–6:55 a.m.	40_{5}	32 23.5	117 18.0	0	2623, 2624	
2652	12	6:05–6:55 a.m.	40_{5}	32 23.5	117 18.0	0	2623, 2624	
2653	20	6:05–6:55 a.m.	40_{5}	32 23.5	117 18.0	0	2623, 2624	
2654	N.0	6:10 a.m.	40_{5}	32 23.5	117 18.0	92–73	.....	
2655	N.0	6:22 a.m.	40_{5}	32 23.5	117 18.0	73–55	.....	
2656	N.0	6:28 a.m.	40_{5}	32 23.5	117 18.0	55–46	.....	
2657	N.0	6:35 a.m.	40_{5}	32 23.5	117 18.0	46–37	.....	
2658	N.0	6:40 a.m.	40_{5}	32 23.5	117 18.0	37–27	.....	
2659	N.0	6:44 a.m.	40_{5}	32 23.5	117 18.0	27–18	.....	
2660	N.0	6:48 a.m.	40_{5}	32 23.5	117 18.0	18–9	.....	
2661	N.0	6:52 a.m.	40_{5}	32 23.5	117 18.0	9–0	.....	
2662	000e	7:15–8:30 a.m.	40_{5}	32 23.5	117 18.0	0	2625, 2626	

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				August 8, 1911				
2663	12	7:15–8:30 a.m.	40_5	From 7:15 to 8:30		0	2625, 2626	
2664	20	7:15–8:30 a.m.	40_5	a.m. the boat		0	2625, 2626	
2665	N.0	7:27 a.m.	40_5	drifted from the		92–73	.....	
2666	N.0	7:35 a.m.	40_5	above position		73–55	.....	
2667	N.0	7:43 a.m.	40_5	to the following		55–46	.....	
2668	N.0	7:48 a.m.	40_5	position		46–37	.....	For water samples
2669	N.0	7:55 a.m.	40_5			37–27	.....	corresponding
2670	N.0	8:10 a.m.	39.5_5			27–0	.....	to N.0 hauls
2671	N.0	8:15 a.m.	39_5			27–18	.....	see p. 171
2672	N.0	8:21 a.m.	39_5			18–9	.....	
2673	N.0	8:24 a.m.	39_5	32° 22.8	117° 17.3	9–0	.....	
2674*	000c	8:45–9:55 a.m.	39.5_5	32 23.5	117 18.0	0	2643	
2675*	12	8:45–9:55 a.m.	39.5_5	32 23.5	117 18.0	0	2643	
2676*	20	8:45–9:55 a.m.	39.5_5	32 23.5	117 18.0	0	2643	
2677†	000c	10:17–10:38 a.m.	40_5	32 23.5	117 18.0	0	2652	
2678†	12	10:17–10:38 a.m.	40_5	32 23.5	117 18.0	0	2652	
2679†	20	10:17–10:38 a.m.	40_5	32 23.5	117 18.0	0	2652	
				August 9, 1911				
2680	000c	3:20–4:23 a.m.	$40_{4.5}$	32 22.7	117 19.2	0	2653, 2654	
2681	12	3:20–4:23 a.m.	$40_{4.5}$	From 3:20 to 4:25		0	2653, 2654	
2682	20	3:20–4:23 a.m.	$40_{4.5}$	a.m. the boat		0	2653, 2654	
2683	N.0	3:27 a.m.	40_5	drifted from the above position		137–92	.....	Dark throughout entire N.0 series
2684	N.0	3:38 a.m.	40_4	to the following		92–73	.....	
2685	N.0	3:49 a.m.	40_4	position		73–55	.....	
2686	N.0	3:55 a.m.	40_4			55–46	.....	
2687	N.0	4:00 a.m.	40_4			46–37	.....	
2688	N.0	4:06 a.m.	40_4			37–27	.....	
2689	N.0	4:12 a.m.	40_4			27–18		
2690	N.0	4:16 a.m.	40_4			18–9	.....	
2691	N.0	4:20 a.m.	40_4	32 21.5	117 18.8	9–0	.....	
2692	000c	4:48–5:45 a.m.	40_5	32 22.7	117 19.2	0	2655, 2658	
2693	20	4:48–5:45 a.m.	40_5	From 4:45 to 7:08		0	2655, 2658	
2694	N.0	4:50 a.m.	40_5	a.m. the boat		137–92	.....	
2695	N.0	5:04 a.m.	40_5	drifted from the		92–73	.....	
2696	N.0	5:10 a.m.	40_5	above position		73–55	.....	
2697	N.0	5:14 a.m.	40_5	to the following		55–46	.....	
2698	N.0	5:20 a.m.	40_5	position		46–37	.....	
2699	N.0	5:25 a.m.	40_5			37–27	.....	
2700	N.0	5:30 a.m.	40_5			27–18	.....	
2701	N.0	5:33 a.m.	40_5			18–9	.....	
2702	N.0	5:36 a.m.	40_5			9–0	.....	
2703	000c	6:06–6:33 a.m.	40_5			0	2675	
2704	20	6:06–6:33 a.m.	40_5	32 22.4	117 18.5	0	2675	
2705	N.0	7:20 a.m.	40_5	32 22.7	117 19.2	137–92	.....	
2706	N.0	7:30 a.m.	40_5	From 7:15 to 8:10		92–73	.....	
2707	N.0	7:40 a.m.	40_5	a.m. the boat		73–55	.....	
2708	N.0	7:45 a.m.	40_5	drifted from the		55–46	.....	
2709	N.0	7:53 a.m.	40_5	above position		46–37	.....	
2710	N.0	7:57 a.m.	40_4	to the following		37–27	.....	
2711	N.0	8:02 a.m.	40_4	position		27–18	.....	
2712	N.0	8:05 a.m.	40_4			18–9	.....	
2713	N.0	8:08 a.m.	40_4			9–0	.....	
2714	000c	7:15–8:10 a.m.	$40_{4.5}$			0	2676, 2677	
2715	20	7:15–8:10 a.m.	$40_{4.5}$	32 22.4	117 18.5	0	2676, 2677	
2716	N.0	8:37 a.m.	40_4	32 22.4	117 21.2	137–92	.....	
2717	N.0	8:45 a.m.	40_4	From 8:35 to 9:20		92–73	.....	
2718	N.0	8:52 a.m.	40_4	a.m. the boat		73–55	.....	
2719	N.0	8:57 a.m.	40_4	drifted from the		55–46	.....	
2720	N.0	9:03 a.m.	40_4	above position		46–37	.....	
2721	N.0	9:08 a.m.	40_4	to the following		37–27	.....	
2722	N.0	9:12 a.m.	40_4	position		27–18	.....	

* From 8:45 to 10:02 a.m. the boat drifted from the position entered to 32° 22.8 N 117° 17.0 W.

† From 10:17 to 10:42 a.m. the boat drifted from the position entered to 32° 23.2 N 117° 17.5 W.

Table 5.—Data Relative to Plankton Hauls—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				August 9, 1911				
2723	N.0	9:15 a.m.	40_4			18–9	.....	For water samples
2724	N.0	9:17 a.m.	40_4			9–0	.....	corresponding
2725	000c	8:35–9:20 a.m.	40_4			0	2678	to N.0 hauls
2726	20	8:35–9:20 a.m.	40_4	32° 22′3	117° 20′2	0	2678	see p. 171
				August 10, 1911				
2727	N.0	3:50 a.m.	40_4	32 22.4	117 21.2	137–92	.....	Cloudy and dark
2728	N.0	4:00 a.m.	40_4	From 3:40 to 4:55		92–73	.....	throughout
2729	N.0	4:08 a.m.	40_4	a.m. the boat		73–55	.....	entire Nansen
2730	N.0	4:15 a.m.	40_4	drifted from the		55–46	.....	series
2731	N.0	4:27 a.m.	40_4	above position		46–37	.....	
2732	N.0	4:33 a.m.	40_4	to the following		37–27	.....	
2733	N.0	4:37 a.m.	40_4	position		27–18	.....	
2734	N.0	4:43 a.m.	40_4			18–9	.....	
2735	N.0	4:47 a.m.	40_4			9 0	.....	
2736	000c	3:45–4:53 a.m.	40_4			0	2679, 2680	
2737	20	3:45–4:53 a.m.	40_4	32 21.3	117 21.5	0	2679, 2680	
2738	N.0	5:10 a.m.	40_4	32 22.4	117 21.2	137–92	.....	
2739	N.0	5:15 a.m.	40_4	From 5:05 to 6:02		92 73	.....	
2740	N.0	5:25 a.m.	40_4	a.m. the boat		73–55	.....	
2741	N.0	5:32 a.m.	40_4	drifted from the		55–46	.....	
2742	N.0	5:38 a.m.	40_4	above position		46–37	.....	
2743	N.0	5:45 a.m.	40_4	to the following		37–27	.....	
2744	N.0	5:48 a.m.	40_4	position		27–18	.....	
2745	N.0	5:53 a.m.	40_4			18–9	.....	
2746	N.0	5:58 a.m.	40_4			9–0	.....	
2747	000c	5:06–6:00 a.m.	40_4			0	2681	
2748	20	5:06–6:00 a.m.	40_4	32 22.5	117 20.5	0	2681	
2749	000c	6:12–7:55 a.m.	40_5	32 23.3	117 20.0	0	2701	
2750	20	6:12–7:55 a.m.	41_4	32 18.2	117 24.7	0	2701	
2751	000c	8:45–9:45 a.m.	41_4	32 18.7	117 24.5	0	2702	
2752	20	8:45–9:45 a.m.	41_4	32 18.7	117 24.5	0	2702	
2753*	000c	.....	41_4	32 18.2	117 24.7	0	2707	
2754*	20	.....	41_4	32 18.2	117 24.7	0	2707	
2755*	000c	12:53–1:45 p.m.	41_4	32 18.2	117 24.7	0	2722	
				August 11, 1911				
2756	000c	5:40–6:40 a.m.	40_4	32 20.6	117 21.3	0	2723	
2757	20	5:40–6:40 a.m.	40_4	32 20.6	117 21.3	0	2723	
2758	000c	7:20–7:48 a.m.	40_4	32 20.5	117 21.2	0	2726	
2759	20	7:20–7:48 a.m.	40_4	32 20.5	117 21.2	0	2726	
2760	000c	8:05–9:12 a.m.	40_4	32 20.0	117 20.5	0	2735	
2761	000c	10:45–11:57 a.m.	40_4	32 22.0	117 19.0	0	2755	
2762	000c	12:46–1:35 p.m.	39_5	32 23.0	117 17.0	0	2772	
				August 21, 1911				
2763	000c	4:27–5:37 a.m.	74_{23}	33 53.0	120 10.7	0	2930	
2764	9	4:27–5:37 a.m.	74_{23}	33 53.0	120 10.7	0	2930	
2765	12	4:27–5:37 a.m.	74_{23}	33 53.0	120 10.7	0	2930	
2766	000c	6:25–6:38 a.m.	75_{22}	33 51.3	120 12.8	0	2933	
2767	9	6:25–6:38 a.m.	75_{22}	33 51.3	120 12.8	0	2933	
2768	12	6:25–6:38 a.m.	75_{22}	33 51.3	120 12.8	0	2933	
2769	N.0	9:45 a.m.	75_{22}	33 49.6	120 16.2	730–550	.....	
2770	N.0	10:30 a.m.	75_{22}	33 49.6	120 16.2	550–365	.....	
2771	N.0	11:05 a.m.	75_{22}	33 49.6	120 16.2	365–185	.....	
2772	N.0	11:30 a.m.	75_{22}	33 49.6	120 16.2	185–0	.....	
2773	000c	11:37–11:56 a.m.	75_{22}	33 49.6	120 16.2	0	2960	
2774	9	11:37–11:56 a.m.	75_{22}	33 49.6	120 16.2	0	2960	
2775	12	11:37–11:56 a.m.	75_{22}	33 49.6	120 16.2	0	2960	
				August 23, 1911				
2776	000c	3:20–3:40 p.m.	51_{16}	33 22.0	118 16.0	0	.....	
2777	9	3:20–3:40 p.m.	51_{16}	33 22.0	118 16.0	0	.....	
2778	12	3:20–3:40 p.m.	51_{16}	33 22.0	118 16.0	0	.....	
2779	000c	3:45–4:00 p.m.	51_{16}	33 22.0	118 16.0	0	2968	
2780	9	3:45–4:00 p.m.	51_{16}	33 22.0	118 16.0	0	2968	

* From 10:15 a.m. to 1:55 p.m. the boat drifted from the position entered to 32° 19′1 N 117° 24′3 W. Hauls 2753 and 2754 began at 11:35 a.m. and ended at 12:45 p.m.

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				August 23, 1911				
2781	12	3:45–4:00 p.m.	51_{16}	33° 22.0	118° 16.0	0	2968	
2782	000c	4:05–4:25 p.m.	51_{16}	33 22.0	118 16.0	0	2969	
2783	9	4:05–4:25 p.m.	51_{16}	33 22.0	118 16.0	0	2969	
2784	12	4:05–4:25 p.m.	51_{16}	33 22.0	118 16.0	0	2969	
				October 24, 1911				
2785	000c	8:00–8:45 a.m.	40_4	32 22.4	117 21.2	0	2978	Amount of drift
2786	9	8:00–8:45 a.m.	40_4	32 22.4	117 21.2	0	2978	unknown
2787	12	8:00–8:45 a.m.	40_4	32 22.4	117 21.2	0	2978	throughout
2788	000c	8:55–10:00 a.m.	40_4	32 22.4	117 21.2	0	2979	entire day
2789	9	8:55–10:00 a.m.	40_4	32 22.4	117 21.2	0	2979	
2790	12	8:55–10:00 a.m.	40_4	32 22.4	117 21.2	0	2979	
2791	N.0	9:50 a.m.	40_4	32 22.4	117 21.2	137–92		For water samples
2792	N.0	10:07 a.m.	40_4	32 22.4	117 21.2	92–73		corresponding
2793	N.0	10:27 a.m.	40_4	32 22.4	117 21.2	73–55		to N.0 hauls
2794	N.0	10:34 a.m.	40_4	32 22.4	117 21.2	55–46		see p. 171
2795	N.0	10:37 a.m.	40_4	32 22.4	117 21.2	46–37		
2796	N.0	10:42 a.m.	40_4	32 22.4	117 21.2	37–27		
2797	N.0	10:45 a.m.	40_4	32 22.4	117 21.2	27–18		
2798	N.0	10:49 a.m.	40_4	32 22.4	117 21.2	18–9		
2799	N.0	10:52 a.m.	40_4	32 22.4	117 21.2	9–0		
2800	000c	10:20–10:55 a.m.	40_4	32 22.4	117 21.2	0	2984	
2801	9	10:20–10:55 a.m.	40_4	32 22.4	117 21.2	0	2984	
2802	12	10:20–10:55 a.m.	40_4	32 22.4	117 21.2	0	2984	
2803*	000c		40_4	32 22.4	117 21.2	0	2985	
2804*	9		40_4	32 22.4	117 21.2	0	2985	
2805*	12		40_4	32 22.4	117 21.2	0	2985	
2806	N.0	11:20 a.m.	40_4	32 22.4	117 21.2	185–137		
2807	N.0	11:32 a.m.	40_4	32 22.4	117 21.2	137–92		
2808	N.0	11:43 a.m.	40_4	32 22.4	117 21.2	92–73		
2809	N.0	11:50 a.m.	40_4	32 22.4	117 21.2	73–55		
2810	N.0	11:58 a.m.	40_4	32 22.4	117 21.2	55–46		
2811	N.0	12:55 p.m.	40_4	32 22.4	117 21.2	46–37		
2812	N.0	1:00 p.m.	40_4	32 22.4	117 21.2	37–27		
2813	N.0	1:03 p.m.	40_4	32 22.4	117 21.2	27–18		
2814	N.0	1:06 p.m.	40_4	32 22.4	117 21.2	18–9		
2815	N.0	1:10 p.m.	40_4	32 22.4	117 21.2	9–0		
2816	N.0	1:22 p.m.	40_4	32 22.4	117 21.2	275–185		
2817	N.0	1:45 p.m.	40_4	32 22.4	117 21.2	365–275		
2818	000c	12:45–1:55 p.m.	40_4	32 22.4	117 21.2	0	2986	
2819	9	12:45–1:55 p.m.	40_4	32 22.4	117 21.2	0	2986	
2820	12	12:45–1:55 p.m.	40_4	32 22.4	117 21.2	0	2986	
2821	000c	2:10–3:07 p.m.	40_4	32 22.4	117 21.2	0	2987	
2822	9	2:10–3:07 p.m.	40_4	32 22.4	117 21.2	0	2987	
2823	12	2:10–3:07 p.m.	40_4	32 22.4	117 21.2	0	2987	
2824	N.0	2:30 p.m.	40_4	32 22.4	117 21.2	460–365		
2825	N.0	3:00 p.m.	40_4	32 22.4	117 21.2	550–460		
				October 25, 1911				
2826	000c	7:10–8:10 a.m.	40_3	32 22.7	117 19.2	0	2988	
2827	9	7:10–8:10 a.m.	40_3	32 22.7	117 19.2	0	2988	
2828	12	7:10–8:10 a.m.	40_3	32 22.7	117 19.2	0	2988	
2829	000c	8:32–9:40 a.m.	40_3	32 22.7	117 19.2	0	2999	Drift unknown
2830	9	8:32–9:40 a.m.	40_3	32 22.7	117 19.2	0	2999	throughout
2831	12	8:32–9:40 a.m.	40_3	32 22.7	117 19.2	0	2999	entire day
2832	N.0	8:43 a.m.	40_3	32 22.7	117 19.2	185–137		
2833	N.0	8:55 a.m.	40_3	32 22.7	117 19.2	137–92		
2834	N.0	9:05 a.m.	40_3	32 22.7	117 19.2	92–73		
2835	N.0	9:13 a.m.	40_3	32 22.7	117 19.2	73–55		
2836	N.0	9:20 a.m.	40_3	32 22.7	117 19.2	55–46		Sky partly over-
2837	N.0	9:25 a.m.	40_3	32 22.7	117 19.2	46–37		cast until 9:35
2838	N.0	9:28 a.m.	40_3	32 22.7	117 19.2	37–27		a.m., after
2839	N.0	9:32 a.m.	40_3	32 22.7	117 19.2	27–18		which it was
2840	N.0	9:35 a.m.	40_3	32 22.7	117 19.2	18–9		bright and clear
2841	N.0	9:38 a.m.	40_3	32 22.7	117 19.2	9–0		

* Haul began at 11:10 a.m. and ended at 12:30 p.m.

Table 5.—Data Relative to Plankton Hauls—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				October 25, 1911				
2842	000c	9:50–10:50 a.m.	40_5	32° 22.7	117° 19.2	0	3000	
2843	9	9:50–10:50 a.m.	40_5	32 22.7	117 19.2	0	3000	
2844	12	9:50–10:50 a.m.	40_5	32 22.7	117 19.2	0	3000	For water samples
2845	N.0	10:00 a.m.	40_5	32 22.7	117 19.2	185–137	.....	corresponding
2846	N.0	10:10 a.m.	40_5	32 22.7	117 19.2	137–92	.....	to N.0 hauls
2847	N.0	10:18 a.m.	40_5	32 22.7	117 19.2	92–73	.....	see p. 171
2848	N.0	10:25 a.m.	40_5	32 22.7	117 19.2	73–55	.....	
2849	N.0	10:30 a.m.	40_5	32 22.7	117 19.2	55–46	.....	
2850	N.0	10:35 a.m.	40_5	32 22.7	117 19.2	46–37	.....	
2851	N.0	10:40 a.m.	40_5	32 22.7	117 19.2	37–27	.....	
2852	N.0	10:44 a.m.	40_5	32 22.7	117 19.2	27–18	.....	
2853	N.0	10:47 a.m.	40_5	32 22.7	117 19.2	18–9	.....	
2854	N.0	10:50 a.m.	40_5	32 22.7	117 19.2	9–0	.....	
2855	000c	10:59–11:59 a.m.	40_5	32 22.7	117 19.2	0	3001	
2856	9	10:59–11:59 a.m.	40_5	32 22.7	117 19.2	0	3001	
2857	12	10:59–11:59 a.m.	40_5	32 22.7	117 19.2	0	3001	
2858	N.0	11:10 a.m.	40_5	32 22.7	117 19.2	275–185	.....	
2859	N.0	11:30 a.m.	40_5	32 22.7	117 19.2	365–275	.....	
2860	N.0	11:55 a.m.	40_5	32 22.7	117 19.2	460–365	.....	
2861	000c	12:10–12:45 p.m.	40_5	32 22.7	117 19.2	0	.....	
2862	9	12:10–12:45 p.m.	40_5	32 22.7	117 19.2	0	.....	
2863	12	12:10–12:45 p.m.	40_5	32 22.7	117 19.2	0	.....	
2864	000c	1:00–1:45 p.m.	40_5	32 22.7	117 19.2	0	3002	
2865	9	1:00–1:45 p.m.	40_5	32 22.7	117 19.2	0	3002	
2866	12	1:00–1:45 p.m.	40_5	32 22.7	117 19.2	0	3002	
2867	N.0	1:15 p.m.	40_5	32 22.7	117 19.2	550–460	.....	
2868	N.0	1:45 p.m.	40_5	32 22.7	117 19.2	550–0	.....	
				October 26, 1911				
2869	K.B.	7:45 a.m.	40_4	32 22.7	117 19.2	550	3003	Drift unknown
2870	K.B.	8:15 a.m.	40_4	32 22.7	117 19.2	460	3005	throughout
2871	000c	7:50–8:50 a.m.	40_4	32 22.7	117 19.2	0	3004	entire day
2872	9	7:50–8:50 a.m.	40_4	32 22.7	117 19.2	0	3004	
2873	12	7:50–8:50 a.m.	40_4	32 22.7	117 19.2	0	3004	
2874	K.B.	8:55 a.m.	40_4	32 22.7	117 19.2	365	3006	
2875	K.B.	9:05 a.m.	40_4	32 22.7	117 19.2	275	3007	
2876	K.B.	9:20 a.m.	40_4	32 22.7	117 19.2	185	3009	
2877	000c	9:00–10:20 a.m.	40_4	32 22.7	117 19.2	0	3008	
2878	9	9:00–10:20 a.m.	40_4	32 22.7	117 19.2	0	3008	
2879	12	9:00–10:20 a.m.	40_4	32 22.7	117 19.2	0	3008	Sky overcast
2880	K.000	10:50–11:05 a.m.	40_4	32 22.7	117 19.2	18	.....	throughout day,
2881	K.000	11:15–11:30 a.m.	40_4	32 22.7	117 19.2	27	.....	becoming
2882	K.000	11:40–11:55 a.m.	40_4	32 22.7	117 19.2	37	.....	cloudy and
2883	000c	12:01–12:31 p.m.	40_4	32 22.7	117 19.2	0	3010	windy in after-
2884	9	12:01–12:31 p.m.	40_4	32 22.7	117 19.2	0	3010	noon, threaten-
2885	12	12:01–12:31 p.m.	40_4	32 22.7	117 19.2	0	3010	ing rain from
2886	K.000	12:50–1:05 p.m.	40_4	32 22.7	117 19.2	46	.....	3:30 to 5:00
2887	K.000	1:10–1:25 p.m.	40_4	32 22.7	117 19.2	64	.....	
2888	K.000	1:35–1:50 p.m.	40_4	32 22.7	117 19.2	92	.....	
2889	K.000	2:00–2:15 p.m.	40_4	32 22.7	117 19.2	137	.....	
2890	K.000	2:35–2:50 p.m.	40_4	32 22.7	117 19.2	185	.....	
2891	K.000	3:07–3:22 p.m.	40_4	32 22.7	117 19.2	275	.....	
2892	K.000	3:40–3:55 p.m.	40_4	32 22.7	117 19.2	365	.....	
2893	K.000	4:17–4:32 p.m.	40_4	32 22.7	117 19.2	460	.....	
				October 27, 1911				
2894	000c	7:00–7:40 a.m.	40_4	32 22.4	117 21.2	0	3011	
2895	9	7:00–7:40 a.m.	40_4	32 22.4	117 21.2	0	3011	
2896	12	7:00–7:40 a.m.	40_4	32 22.4	117 21.2	0	3011	
2897	K.000	8:00–8:15 a.m.	40_4	32 22.4	117 21.2	18	.....	Threatening rain
2898	K.000	8:20–8:35 a.m.	40_4	32 22.4	117 21.2	27	.....	
2899	K.000	8:42–8:57 a.m.	40_4	32 22.4	117 21.2	37	.....	Drift unknown
2900	K.000	9:20–9:35 a.m.	40_4	32 22.4	117 21.2	46	.....	throughout
2901	K.000	9:45–10:00 a.m.	40_4	32 22.4	117 21.2	55	.....	entire day
2902	K.000	10:10–10:25 a.m.	40_4	32 22.4	117 21.2	73	.....	
2903	K.000	10:50–11:05 a.m.	40_4	32 22.4	117 21.2	92	.....	

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				October 27, 1911				
2904	K.000	11:15–11:30 a.m.	40₄	32° 22.4	117° 21.2	110	....	
2905	K.000	12:01–12:16 p.m.	40₄	32 22.4	117 21.2	137	.....	Raining from
2906	000c	12:01–12:30 p.m.	40₄	32 22.4	117 21.2	0	3012	12:30 to 1:30
2907	9	12:01–12:30 p.m.	40₄	32 22.4	117 21.2	0	3012	p.m., after
2908	12	12:01–12:30 p.m.	40₄	32 22.4	117 21.2	0	3012	which sky
2909	000c	1:05–1:55 p.m.	40₄	32 22.4	117 21.2	0	....	began to clear
2910	9	1:05–1:55 p.m.	40₄	32 22.4	117 21.2	0	....	
2911	12	1:05–1:55 p.m.	40₄	32 22.4	117 21.2	0	.....	
2912	K.000	1:30–1:45 p.m.	40₄	32 22.4	117 21.2	185	.....	
2913	K.000	2:20–2:35 p.m.	40₄	32 22.4	117 21.2	275	.. ..	
2914	K.000	2:55–3:10 p.m.	40₄	32 22.4	117 21.2	365	.....	
2915	K.000	3:50–4:05 p.m.	40₄	32 22.4	117 21.2	460	. .. .	
				October 28, 1911				
2916	000c	8:55 a.m.	40₅	32 22.7	117 19.2	550–0	... .	Clear and bright
2917	000c	9:25–9:45 a.m.	40₅	32 22.7	117 19.2	0	3013	throughout day
2918	9	9:25–9:45 a.m.	40₅	32 22.7	117 19.2	0	3013	
2919	12	9:25–9:45 a.m.	40₅	32 22.7	117 19.2	0	3013	
2920	.....	....	40₅	32 22.7	117 19.2	0	.....	Dip-net haul
2921	000c	9:50–10:10 a.m.	40₅	32 22.7	117 19.2	0	. . . .	
2922	9	9:50–10:10 a.m.	40₅	32 22.7	117 19.2	0	....	
2923	12	9:50–10:10 a.m.	40₅	32 22.7	117 19.2	0	.. ..	
2924	000c	10:20–10:45 a.m.	40₅	32 22.7	117 19.2	0	. ...	
2925	9	10:20–10:45 a.m.	40₅	32 22.7	117 19.2	0	. .. . .	
2926	12	10:20–10:45 a.m.	40₅	32 22.7	117 19.2	0	.....	
				November 29, 1911				
2927	000c	4:46–5:10 p.m.	39₆	32 29.5	117 13.5	0	3014	
2928	9	4:46–5:10 p.m.	39₆	32 29.5	117 13.5	0	3014	
2929	12	4:46–5:10 p.m.	39₆	32 29.5	117 13.5	0	3014	
				November 30, 1911				
2930	000c	4:35–5:20 a.m.	40₄₅	32 23.5	117 18.0	0	3017	Bright starlight
2931	9	4:35–5:20 a.m.	40₄₅	From 4:10 to 6:07 a.m. the boat drifted from the above position to the following position		0	3017	but no moon until 5:25, when twilight began. Sunrise 6:35; bright and
2932	12	4:35–5:20 a.m.	40₄₅			0	3017	clear thereafter
2933	N.0	5:26 a.m.	40₄			137–92	.....	For water samples
2934	000c	5:30–6:45 a.m.	40₄			0	3018	corresponding
2935	9	5:30–6:45 a.m.	40₄			0	3018	to N.0 hauls
2936	12	5:30–6:45 a.m.	40₄			0	3018	see p. 171
2937	N.0	5:44 a.m.	40₄			92–73	.....	
2938	N.0	5:55 a.m.	40₄			73–55	....	
2939	N.0	6:06 a.m.	40₄	32 21.8	117 21.1	55–37	.....	
2940	N.0	6:16 a.m.	40₄	32 21.8	117 21.1	55–46	.....	
2941	N.0	6:24 a.m.	40₄	32 21.8	117 21.1	46–37	... .	
2942	N.0	6:31 a.m.	40₄	32 21.8	117 21.1	37–27	. ...	
2943	N.0	6:35 a.m.	40₄	32 21.8	117 21.1	27–18	.....	
2944	N.0	6:39 a.m.	40₄	32 21.8	117 21.1	18–9	....	
2945*	000c	8:10–9:05 a.m.	40₅	32 23.5	117 18.0	0	3019	
2946*	9	8:10–9:05 a.m.	40₅	32 23.5	117 18.0	0	3019	
2947*	12	8:10–9:05 a.m.	40₅	32 23.5	117 18.0	0	3019	
2948*	N.0	9:08 a.m.	40₅	32 23.5	117 18.0	137–92	....	
2949	000c	9:30–10:30 a.m.	40₅	32 23.5	117 18.0	0	3020	
2950	9	9:30–10:30 a.m.	40₅	From 9:30 to 10:30 a.m. the boat drifted from the above position to the following position		0	3020	
2951	12	9:30–10:30 a.m.	40₅			0	3020	
2952	N.0	9:35 a.m.	40₅			92–73	....	
2953	N.0	9:45 a.m.	40₅			73–55	.....	
2954	N.0	9:50 a.m.	40₅			55–46	.....	
2955	N.0	9:57 a.m.	40₅			46–37	....	
2956	N.0	10:02 a.m.	40₅			37–27	.....	
2957	N.0	10:05 a.m.	40₅			27–18	.....	
2958	N.0	10:25 a.m.	40₅			18–9	.....	
2959	N.0	10:30 a.m.	40₅	32 22.7	117 19.2	9–0	.....	

* From 8:10 to 9:05 a.m. the boat drifted from the position entered to 32° 22.7 N 117° 19.2 W.

Table 5.—Data Relative to Plankton Hauls—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				December 1, 1911				
2960	000c	3:50–4:15 a.m.	$40_{4.5}$	32° 22′7	117° 19′2	0	3022	
2961	9	3:50–4:15 a.m.	$40_{4.5}$	From 3:45 to 5:45		0	3022	
2962	12	3:50–4:15 a.m.	$40_{4.5}$	a.m. the boat		0	3022	
2963	N.0	4:20 a.m.	40_4	drifted from the		137–92	.....	
2964	000c	4:25–5:30 a.m.	40_4	above position		0	3024	
2965	9	4:25–5:30 a.m.	40_4	to the following		0	3024	
2966	12	4:25–5:30 a.m.	40_4	position		0	3024	
2967	N.0	4:33 a.m.	40_4			92–73	.....	
2968	N.0	4:40 a.m.	40_4			73–55	.....	
2969	N.0	4:47 a.m.	40_4			55–46	.....	
2970	N.0	4:52 a.m.	40_4			46–37	.....	For water samples
2971	N.0	4:57 a.m.	40_4			37–27	.....	corresponding
2972	N.0	5:00 a.m.	40_4			27–18	.....	to N.0 hauls
2973	N.0	5:05 a.m.	40_4			18–9	.....	see p. 171
2974	N.0	5:07 a.m.	40_4	32 21.3	117 20.4	9–0	.....	
2975	000c	6:05–7:10 a.m.	$40_{4.5}$	32 22.7	117 19.2	0	3025	
2976	9	6:05–7:10 a.m.	$40_{4.5}$	From 6:00 to 8:30		0	3025	
2977	12	6:05–7:10 a.m.	$40_{4.5}$	a.m. the boat		0	3025	
2978	N.0	6:30 a.m.	40_5	drifted from the		137–92	.....	Sunrise 6:34 a.m.
2979	N.0	6:40 a.m.	40_5	above position		92–73	.....	
2980	N.0	6:47 a.m.	40_4	to the following		73 55	.....	
2981	N.0	6:54 a.m.	40_4	position		55–46	.....	
2982	N.0	6:58 a.m.	40_4			46–37	.....	
2983	N.0	7:02 a.m.	40_4			37–27	.....	
2984	N.0	7:06 a.m.	40_4			27–18	.....	
2985	N.0	7:08 a.m.	40_4			18–9	.....	
2986	N.0	7:10 a.m.	40_4			9 0	.....	
2987	000c	7:50–8:25 a.m.	40_4			0	3026	
2988	9	7:50–8:25 a.m.	40_4			0	3026	
2989	12	7:50–8:25 a.m.	40_4			0	3026	
2990	N.0	7:50 a.m.	40_4			137–92	.....	
2991	N.0	7:57 a.m.	40_4			92–73	.....	
2992	N.0	8:03 a.m.	40_4			73–55	.....	
2993	N.0	8:07 a.m.	40_4			55–46	.....	
2994	N.0	8:13 a.m.	40_4			46 37	.....	
2995	N.0	8:16 a.m.	40_4			37–27	.....	
2996	N.0	8:19 a.m.	40_4			27–18	.....	
2997	N.0	8:22 a.m.	40_4			18 9	.....	
2998	N.0	8:25 a.m.	40_4	32 22.0	117 19.3	9–0	.....	
2999	000c	8:45–9:27 a.m.	40_4	32 22.4	117 21.2	0	3027	
3000	9	8:45–9:27 a.m.	40_4	32 22.4	117 21.2	0	3027	
3001	12	8:45–9:27 a.m.	40_4	32 22.4	117 21.2	0	3027	
3002	N.0	8:46 a.m.	40_4	32 22.4	117 21.2	137–92	.....	
3003	N.0	8:55 a.m.	40_4	32 22.4	117 21.2	92–73	.....	
3004	N.0	9:03 a.m.	40_4	32 22.4	117 21.2	73–55	.....	
3005	N.0	9:08 a.m.	40_4	32 22.4	117 21.2	55–46	.....	
3006	N.0	9:13 a.m.	40_4	32 22.4	117 21.2	46–37	.....	
3007	N.0	9:16 a.m.	40_4	32 22.4	117 21.2	37–27	.....	
3008	N.0	9:20 a.m.	40_4	32 22.4	117 21.2	27–18	.....	
3009	N.0	9:24 a.m.	40_4	32 22.4	117 21.2	18–9	.....	
3010	N.0	9:26 a.m.	40_4	32 22.4	117 21.2	9–0	.....	
				December 2, 1911				
3011	000c	4:05–4:50 a.m.	40_4	32 22.4	117 21.2	0	3028	Clear but no moon.
3012	9	4:05–4:50 a.m.	40_4	32 22.4	117 21.2	0	3028	Twilight began
3013	12	4:05–4:50 a.m.	40_4	32 22.4	117 21.2	0	3028	at 5:52 a.m.
3014	N.0	4:50 a.m.	40_4	32 22.4	117 21.2	137–92	.....	Ocean excep-
3015	000c	5:00–7:55 a.m.	40_4	32 22.4	117 21.2	0	3029	tionally smooth
3016	9	5:00–7:55 a.m.	40_4	32 22.4	117 21.2	0	3029	No drift detected
3017	12	5:00–7:55 a.m.	40_4	32 22.4	117 21.2	0	3029	by noon
3018	N.0	5:00 a.m.	40_4	32 22.4	117 21.2	92–73	.....	
3019	N.0	5:05 a.m.	40_4	32 22.4	117 21.2	73 55	.....	
3020	N.0	5:10 p.m.	40_4	32 22.4	117 21.2	55–46	.....	
3021	N.0	5:15 a.m.	40_4	32 22.4	117 21.2	46 37	.....	
3022	N.0	5:20 a.m.	40_4	32 22.4	117 21.2	37–27	.....	

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position		Depth in meters	Water sample number	Remarks
				N lat.	W long.			
				December 2, 1911				
3023	N.0	5:24 a.m.	40_4	32° 22.4	117° 21.2	27 18		
3024	N.0	5:27 a.m.	40_4	32 22.4	117 21.2	18–9		
3025	N.0	5:30 a.m.	40_4	32 22.4	117 21.2	9–0		
3026	K.000	8:23–8:38 a.m.	40_4	32 22.4	117 21.2	18		
3027	K.000	8:58–9:13 a.m.	40_4	32 22.4	117 21.2	27		
3028	K.000	9:24–9:39 a.m.	40_4	32 22.4	117 21.2	37		
3029	K.000	9:46–10:01 a.m.	40_4	32 22.4	117 21.2	46		Bright, clear, and calm
3030	K.000	10:08–10:23 a.m.	40_4	32 22.4	117 21.2	55		
3031	K.000	10:30–10:45 a.m.	40_4	32 22.4	117 21.2	73		
3032	K.000	10:55–11:09 a.m.	40_4	32 22.4	117 21.2	92		
3033	K.000	11:20–11:35 a.m.	40_4	32 22.4	117 21.2	137		
3034	K.000	11:44–11:59 a.m.	40_4	32 22.4	117 21.2	185		
3035	K.000	12:22–12:37 p.m.	40_4	32 22.4	117 21.2	275		
3036	K.000	12:54–1:09 p.m.	40_4	32 22.4	117 21.2	365		
3037	K.000	1:32–1:47 p.m.	40_4	32 22.4	117 21.2	460		
				December 3, 1911				
3038	K.000	5:10–5:23 a.m.	40_5	32 22.7	117 19.2	18		Extremely dark till dawn at 5:25 a.m. Sunrise 6:32 a.m. Calm, smooth, and cloudy
3039	K.000	5:27–5:40 a.m.	40_5	32 22.7	117 19.2	27		
3040	K.000	5:45–5:58 a.m.	40_5	32 22.7	117 19.2	37		
3041	K.000	6:08–6:21 a.m.	40_5	32 22.7	117 19.2	365		
3042			40_5	32 22.7	117 19.2	0		Dip-net haul
3043	K.000	6:36–6:49 a.m.	40_5	32 22.7	117 19.2	46		
3044	K.000	6:53–7:06 a.m.	40_5	32 22.7	117 19.2	55		
3045			40_5	32 22.7	117 19.2	0		Dip-net haul
3046	K.000	7:12–7:25 a.m.	40_5	32 22.7	117 19.2	73		
3047	K.000	7:36–7:49 a.m.	40_5	32 22.7	117 19.2	92		
3048	K.000	7:56–8:09 a.m.	40_5	32 22.7	117 19.2	137		
3049	K.000	8:17–8:30 a.m.	40_5	32 22.7	117 19.2	185		
3050	K.000	8:42–8:55 a.m.	40_5	32 22.7	117 19.2	275		
				December 27, 1911				
3051	000c	4:15–6:10 a.m.	$40_{4.5}$	32 23.5	117 18.0	0	3033	For water samples corresponding to N.0 hauls see p. 171
3052	9	4:15–6:10 a.m.	$40_{4.5}$	From 4:05 to 7:30		0	3033	
3053	000c	6:15–7:30 a.m.	40_4	a.m. the boat		0	3034	
3054	9	6:15–7:30 a.m.	40_4	drifted from the		0	3034	
3055	N.0	6:20 a.m.	40_4	above position		137–92		
3056	N.0	6:30 a.m.	40_4	to the following		92 73		
3057	N.0	6:40 a.m.	40_4	position		73–55		
3058	N.0	6:50 a.m.	40_4			55 46		
3059	N.0	6:55 a.m.	40_4			46–37		
3060	N.0	7:00 a.m.	40_4			37 27		
3061	N.0	7:07 a.m.	40_4			27–18		
3062	N.0	7:10 a.m.	40_4			18–9		
3063	N.0	7:13 a.m.	40_4	32 20.2	117 18.5	9 0		
3064	000c	8:40–9:05 a.m.	40_5	32 23.5	117 18.0	0	3035	
3065	9	8:40–9:05 a.m.	40_5	32 23.5	117 18.0	0	3035	
3066	N.0	8:50 a.m.	40_5	32 23.5	117 18.0	137–92		
3067	N.0	9:00 a.m.	40_5	32 23.5	117 18.0	92–73		
3068	N.0	9:07 a.m.	40_5	32 23.5	117 18.0	73–55		No drift detected by 9:40 a.m.
3069	000c	9:10–9:38 a.m.	40_5	32 23.5	117 18.0	0	3036	
3070	9	9:10–9:38 a.m.	40_5	32 23.5	117 18.0	0	3036	
3071	N.0	9:12 a.m.	40_5	32 23.5	117 18.0	55–46		
3072	N.0	9:17 a.m.	40_5	32 23.5	117 18.0	46 37		
3073	N.0	9:22 a.m.	40_5	32 23.5	117 18.0	37–27		
3074	N.0	9:30 a.m.	40_5	32 23.5	117 18.0	27–18		
3075	N.0	9:32 a.m.	40_5	32 23.5	117 18.0	18 9		
3076	N.0	9:36 a.m.	40_5	32 23.5	117 18.0	9 0		
3077	000c	10:00–10:48 a.m.	40_5	32 22.7	117 19.2	0	3037	
3078	9	10:00–10:48 a.m.	40_5	32 22.7	117 19.2	0	3037	
3079	N.0	10:07 a.m.	40_5	32 22.7	117 19.2	137–92		
3080	N.0	10:16 a.m.	40_5	32 22.7	117 19.2	92–73		
3081	N.0	10:23 a.m.	40_5	32 22.7	117 19.2	73–55		
3082	N.0	10:30 a.m.	40_5	32 22.7	117 19.2	55–46		

Table 5.—Data Relative to Plankton Hauls—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				December 27, 1911				
3083	N.0	10:35 a.m.	40_5	32° 22.7	117° 19.2	46–37	.....	
3084	N.0	10:40 a.m.	40_5	32 22.7	117 19.2	37–27	.....	
3085	N.0	10:42 a.m.	40_5	32 22.7	117 19.2	27–18	.....	
3086	N.0	10:44 a.m.	40_5	32 22.7	117 19.2	18–9	.....	No drift detected
3087	N.0	10:46 a.m.	40_5	32 22.7	117 19.2	9–0	.....	by 10:50 a.m.
				December 28, 1911				
3088	000c	4:10–4:52 a.m.	40_5	32 22.7	117 19.2	0	3042	For water samples
3089	9	4:10–4:52 a.m.	40_5	From 4:10 to 6:22		0	3042	corresponding
3090	000c	4:55–6:25 a.m.	$40_{4.5}$	a.m. the boat		0	3044	to N.0 hauls
				drifted from the				see p. 171
3091	9	4:55–6:25 a.m.	$40_{4.5}$	above position		0	3044	Dark until dawn
3092	N.0	4:55 a.m.	40_5	to the following		137–92	.....	at 5:50 a.m.
3093	N.0	5:08 a.m.	40_4	position		92–73	.....	Partly cloudy
3094	N.0	5:19 a.m.	40_4			73–55	.....	until 9:05 a.m.,
3095	N.0	5:28 a.m.	40_4			55–46	.....	when it became
3096	N.0	5:35 a.m.	40_4			46–37	.....	very cloudy and
3097	N.0	5:43 a.m.	40_4			37–27	.....	threatened rain
3098	N.0	5:48 a.m.	40_4			27–18	.....	
3099	N.0	5:53 a.m.	40_4			18–9	.....	
3100	N.0	5:57 a.m.	40_4	32 22.25	117 18.3	9–0	.....	
3101	000c	7:40–9:15 a.m.	40_4	32 22.4	117 21.2	0	3046	
3102	9	7:40–9:15 a.m.	40_4	From 7:40 to 9:15		0	3046	
3103	N.0	8:12 a.m.	40_4	a.m. the boat		137–92	.....	
3104	N.0	8:20 a.m.	40_4	drifted from the		92–73	.....	
3105	N.0	8:28 a.m.	40_4	above position		73–55	.....	
3106	N.0	8:35 a.m.	40_4	to the following		55–46	.....	
3107	N.0	8:40 a.m.	40_4	position		46–37	.....	
3108	N.0	8:44 a.m.	40_4			37–27	.....	
3109	N.0	8:48 a.m.	40_4			27–18	.....	
3110	N.0	8:51 a.m.	40_4			18–9	.....	
3111	N.0	8:53 a.m.	40_4	32 20.3	117 22.0	9–0	.....	
				February 9, 1912				
3112	000c	3:50–5:50 a.m.	40_5	32 23.5	117 18.0	0	3057	No moon but clear.
3113	9	3:50–5:50 a.m.	40_5	From 3:25 to 6:50		0	3057	Dawn at 5:50
3114	N.0	4:18 a.m.	40_5	a.m. the boat		137–92	.....	a.m. High fog
3115	N.0	4:33 a.m.	40_5	drifted from the		92–73	.....	
3116	N.0	4:45 a.m.	40_5	above position		73–55	.....	
3117	N.0	4:55 a.m.	40_5	to the following		55–46	.....	
3118	N.0	5:02 a.m.	40_5	position		46–37	.....	
3119	N.0	5:07 a.m.	40_5			37–27	.....	
3120	N.0	5:14 a.m.	40_5			27–18	.....	
3121	N.0	5:17 a.m.	40_5			18–9	.....	
3122	N.0	5:22 a.m.	40_5			9–0	.....	
3123	N.0	6:00 a.m.	40_4			137–92	.....	
3124	000c	6:00–7:05 a.m.	40_4			0	3058	Cloudy and dis-
3125	9	6:00–7:05 a.m.	40_4			0	3058	mal from 6:50 a.m. until 12:20 p.m.
3126	N.0	6:15 a.m.	40_4			92–73	.....	
3127	N.0	6:24 a.m.	40_4			73–55	.....	
3128	N.0	6:35 a.m.	40_4			55–46	.....	
3129	N.0	6:40 a.m.	40_4			46–37	.....	
3130	N.0	6:45 a.m.	40_4			37–27	.....	
3131	N.0	6:50 a.m.	40_4	32 21.7	117 18.0	27–0	.....	
3132	N.0	6:55 a.m.	40_4	32 21.7	117 18.0	27–18	.....	
3133	N.0	6:58 a.m.	40_4	32 21.7	117 18.0	18–9	.....	
3134	N 0	7:01 a.m.	40_4	32 21.7	117 18.0	9–0	.....	
3135	000c	7:40–9:15 a.m.	40_5	32 23.5	117 18.0	0	3060	
3136	9	7:40–9:15 a.m.	40_5	32 23.5	117 18.0	0	3060	
3137	N.0	7:50 a.m.	40_5	From 7:40 to 9:15		137–92	.....	
3138	N.0	8:00 a.m.	40_5	a.m. the boat		92–73	.....	
3139	N.0	8:05 a.m.	40_5	drifted from the		73–55	.....	
3140	N.0	8:12 a.m.	40_5	above position		55–46	.....	
3141	N.0	8:18 a.m.	40_5	to the following		46–37	.....	
3142	N.0	8:22 a.m.	40_5	position		37–27	.....	

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				February 9, 1912				
3143	N.0	8:27 a.m.	40₅			27-18		
3144	N.0	8:32 a.m.	40₅			18-0		
3145	N.0	8:35 a.m.	40₅			18 9		
3146	N.0	8:37 a.m.	40₅	32° 23.0	117° 17.7	9-0		
3147	000c	9:42–10:56 a.m.	40₅	32 22.7	117 19.2	0	3072	For water samples corresponding to N.0 hauls see p. 171
3148	9	9:42–10:56 a.m.	40₅	From 9:40 to 10:56		0	3072	
3149	N.0	10:10 a.m.	40₅	a.m. the boat		137–92		
3150	N.0	10:20 a.m.	40₅	drifted from the		92–73		
3151	N.0	10:27 a.m.	40₅	above position		73–55		
3152	N.0	10:35 a.m.	40₅	to the following		55–46		
3153	N.0	10:40 a.m.	40₅	position		46–37		
3154	N.0	10:48 a.m.	40₅			37–27		
3155	N.0	10:52 a.m.	40₅			27–18		
3156	N.0	10:54 a.m.	40₅			18–9		
3157	N.0	10:56 a.m.	40₅	32 22.6	117 19.0	9–0		
3158*	000c		40₄	32 22.4	117 21.2	0	3081	
3159*	9		40₄	32 22.4	117 21.2	0	3081	
3160	N.0	11:26 a.m.	40₄	From 11:20 a.m. to		137–92		
3161	N.0	11:35 a.m.	40₄	1:00 p.m. the boat		92–73		
3162	N.0	11:43 a.m.	40₄	drifted from the		73–55		
3163	N.0	11:51 a.m.	40₄	above position		55–46		
3164	N.0	11:59 a.m.	40₄	to the following		46–37		
3165	N.0	12:04 p.m.	40₄	position		37–27		
3166	N.0	12:08 p.m.	40₄			27–0		
3167	N.0	12:12 p.m.	40₄			27–18		
3168	N.0	12:16 p.m.	40₄			18–9		
3169	N.0	12:20 p.m.	40₄	32 21.75	117 20.4	9–0		
				February 10, 1912				
3170	000c	3:50–5:40 a.m.	40₅	32 22.7	117 19.2	0		
3171	9	3:50–5:40 a.m.	40₅	32 22.7	117 19.2	0		
3172	N.0	4:28 a.m.	40₅	32 22.7	117 19.2	137–92		Dark throughout entire Nansen series
3173	N.0	4:40 a.m.	40₅	32 22.7	117 19.2	92 73		
3174	N.0	5:05 a.m.	40₅	32 22.7	117 19.2	73–55		
3175	N.0	5:11 a.m.	40₅	32 22.7	117 19.2	55–46		
3176	N.0	5:18 a.m.	40₅	32 22.7	117 19.2	46-37		
3177	N.0	5:23 a.m.	40₅	32 22.7	117 19.2	37 27		
3178	N.0	5:27 a.m.	40₅	32 22.7	117 19.2	27 18		
3179	N.0	5:30 a.m.	40₅	32 22.7	117 19.2	18–9		
3180	N.0	5:37 a.m.	40₅	32 22.7	117 19.2	9–0		
				March 22, 1912				
3183	000c	9:25–10:00 a.m.	B	32 39.8	117 14.1	0		Hauls made while the Agassiz was anchored in the mouth of San Diego Bay
3184	12	9:25–10:00 a.m.	B	32 39.8	117 14.1	0		
3185	20	9:25–10:00 a.m.	B	32 39.8	117 14.1	0		
3186	000c	10:10–10:45 a.m.	B	32 39.8	117 14.1	0		
3187	12	10:10–10:45 a.m.	B	32 39.8	117 14.1	0		
3188	20	10:10–10:45 a.m.	B	32 39.8	117 14.1	0		
3189	000c	11:05–11:25 a.m.	B	32 39.8	117 14.1	0		
3190	12	11:05–11:25 a.m.	B	32 39.8	117 14.1	0		
3191	20	11:05–11:25 a.m.	B	32 39.8	117 14.1	0		
				March 23, 1912				
3192	000c	3:02–4:35 a.m.	40₅	32 23.5	117 18.0	0	3092	Dark and clear; no moon
3193	12	3:02–4:35 a.m.	40₅	From 3:00 to 6:00		0	3092	Twilight from 4:45 until sunrise at 5:50 a.m. Clear all day
3194	20	3:02–4:35 a.m.	40₅	a.m. the boat		0	3092	
3195	N.0	3:10 a.m.	40₅	drifted from the		137–92		
3196	N.0	3:14 a.m.	40₅	above position		92–73		
3197	N.0	3:25 a.m.	40₅	to the following		73–55		
3198	N.0	3:45 a.m.	40₅	position		55–46		
3199	N.0	3:55 a.m.	40₅			46–37		
3200	N.0	4:01 a.m.	40₅			37–27		
3201	N.0	4:10 a.m.	40₅			27–18		

* Haul began at 11:25 a.m. and ended at 1:00 p.m.

Table 5.—Data Relative to Plankton Hauls—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				March 23, 1912				
3202	N.0	4:15 a.m.	40_5			18–9	.....	
3203	N.0	4:20 a.m.	40_5			9–0	.....	
3204	000c	4:45–6:00 a.m.	40_5			0	3105	For water samples
3205	12	4:45–6:00 a.m.	40_5			0	3105	corresponding
3206	20	4:45–6:00 a.m.	40_5			0	3105	to N.0 hauls
3207	N.0	4:50 a.m.	40_5			137–92	.....	see p. 171
3208	N.0	5:02 a.m.	40_5			92–73	.....	
3209	N.0	5:12 a.m.	40_5			73–55	.....	
3210	N.0	5:20 a.m.	40_5			55 46	.....	
3211	N.0	5:26 a.m.	40_5			46–37	.....	
3212	N.0	5:35 a.m.	40_5			37–27	.....	
3213	N.0	5:40 a.m.	40_5			27–18	.....	
3214	N.0	5:45 a.m.	40_5			18–9	.....	
3215	N.0	5:55 a.m.	40_5	32° 22.75	117° 18.5	9–0	.....	
3216	000c	6:40–7:45 a.m.	40_5	32 23.5	117 18.0	0	3119	
3217	12	6:40–7:45 a.m.	40_5	From 6:40 to 7:45		0	3119	
3218	20	6:40–7:45 a.m.	40_5	a.m. the boat		0	3119	
3219	N.0	6:40 a.m.	40_5	drifted from the		137–92	.....	
3220	N.0	6:56 a.m.	40_5	above position		92–73	.....	
3221	N.0	7:06 a.m.	40_5	to the following		73–55	.....	
3222	N.0	7:11 a.m.	40_5	position		55–46	.....	
3223	N.0	7:20 a.m.	40_5			46–37	.....	
3224	N.0	7:25 a.m.	40_5			37–27	.....	
3225	N.0	7:30 a.m.	40_5			27 18	.....	
3226	N.0	7:34 a.m.	40_5			18–9	.....	
3227	N.0	7:38 a.m.	40_5	32 24.0	117 18 0.	9–0	.....	
3228	000c	8:12–9:20 a.m.	40_5	32 22.7	117 19.2	0	3121	
3229	12	8:12–9:20 a.m.	40_5	From 8:12 to 9:20		0	3121	
3230	20	8:12–9:20 a.m.	40_5	a.m. the boat		0	3121	
3231	N.0	8:18 a.m.	40_5	drifted from the		137–0	.....	
3232	N.0	8:30 a.m.	40	above position		137–92	.....	
3233	N.0	8:40 a.m.	40_5	to the following		92–73	.....	
3234	N.0	8:46 a.m.	40_5	position		73 55	.....	
3235	N.0	8:52 a.m.	40_5			55–46	.....	
3236	N.0	9:00 a.m.	40_5			46 37	.....	
3237	N.0	9:04 a.m.	40_5			37–27	.....	
3238	N.0	9:10 a.m.	40_5			27 18	.....	
3239	N.0	9:12 a.m.	40_5			18–9	.....	
3240	N.0	9:15 a.m.	40_5	32 23.2	117 18.5	9 0	.....	
3241	000c	9:52–10:55 a.m.	$40_{1.5}$	32 22.4	117 21.2	0	3132	
3242	12	9:52–10:55 a.m.	$40_{1.5}$			0	3132	
3243	20	9:52–10:55 a.m.	$40_{1.5}$	From 9:52 to 10:55		0	3132	
3244	N.0	10:00 a.m.	40_1	a.m. the boat		137–92	.....	
3245	N.0	10:10 a.m.	40_1	drifted from the		92–73	.....	
3246	N.0	10:16 a.m.	40_5	above position		73–55	.....	
3247	N.0	10:24 a.m.	40_5	to the following		55–46	.....	
3248	N.0	10:30 a.m.	40_5	position		46–37	.....	
3249	N.0	10:36 a.m.	40_5			37 27	.....	
3250	N.0	10:41 a.m.	40_5			27–18	.....	
3251	N.0	10:47 a.m.	40_5			18 9	.....	
3252	N.0	10:50 a.m.	40_5	32 22.75	117 20.5	9–0	.....	
				March 24, 1912				
3253	000c	3:15–4:30 a.m.	$40_{1.5}$	32 22.7	117 19.2	0	3142	Dark until begin-
3254	12	3:15–4:30 a.m.	$40_{1.5}$	From 3:15 to 6:30		0	3142	ning of twilight
3255	20	3:15–4:30 a.m.	$40_{1.5}$	a.m. the boat		0	3142	at 4:50 a.m.
3256	N.0	3:20 a.m.	40_5	drifted from the		137–92	.....	Partly cloudy
3257	N.0	3:30 a.m.	40_5	above position		92–73	.....	until 8 a.m.
3258	N.0	3:38 a.m.	40_5	to the following		73–55	.....	
3259	N.0	3:46 a.m.	$40_{1.5}$	position		55–46	.....	
3260	N.0	3:58 a.m.	40_1			46–37	.....	
3261	N.0	4:05 a.m.	40_1			37–27	.....	
3262	N.0	4:09 a.m.	40_1			27 18	.....	
3263	N.0	4:15 a.m.	40_1			18–9	.....	
3264	N.0	4:18 a.m.	40_1			9–0	.....	

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				March 24, 1912				
3265	N.0	4:45 a.m.	40$_4$			137–92		
3266	000e	5:00–7:30 a.m.	40$_4$			0	3159	
3267	12	5:00–7:30 a.m.	40$_4$			0	3159	
3268	20	5:00–7:30 a.m.	40$_4$			0	3159	
3269	N.0	5:40 a.m.	40$_4$			92–73		
3270	N.0	5:48 a.m.	40$_4$			73–55		
3271	N.0	5:54 a.m.	40$_4$			55–46		
3272	N.0	5:59 a.m.	40$_4$			46–37		
3273	N.0	6:05 a.m.	40$_4$			37–27		
3274	N.0	6:08 a.m.	40$_4$			27–18		
3275	N.0	6:13 a.m.	40$_4$			18–9		
3276	N.0	6:16 a.m.	40$_4$	32° 21′2	117° 19′5	9–0		
3277	K.000	8:03–8:18 a.m.	40$_4$	32 21.3	117 19.0	9		Hauls 3277 to
3278	000e	8:03–8:18 a.m.	40$_4$	32 21.3	117 19.0	0	3161	3292 were made
3279	K.000	8:26–8:41 a.m.	40$_4$	32 21.5	117 18.7	18		while the boat
3280	000e	8:26–8:41 a.m.	40$_4$	32 21.5	117 18.7	0	3162	was steaming
3281	K.000	8:50–9:05 a.m.	40$_4$	32 22.3	117 18.5	27		slowly ahead,
3282	000e	8:50–9:05 a.m.	40$_4$	32 22.3	117 18.5	0	3163	and the posi-
3283	K.000	9:12–9:27 a.m.	40$_4$	32 22.3	117 18.75	37		tions entered
3284	000e	9:12–9:27 a.m.	40$_4$	32 22.3	117 18.75	0	3164	correspond to
3285	K.000	9:35–9:50 a.m.	40$_4$	32 22.6	117 18.6	46		the beginning
3286	000e	9:35–9:50 a.m.	40$_4$	32 22.6	117 18.6	0	3165	of each haul
3287	K.000	10:00–10:15 a.m.	40$_5$	32 22.75	117 19.0	92		
3288	000e	10:00–10:15 a.m.	40$_5$	32 22.75	117 19.0	0	3166	
3289	K.000	10:26–10:41 a.m.	40$_5$	32 22.6	117 19.3	137		
3290	000e	10:26–10:41 a.m.	40$_5$	32 22.6	117 19.3	0	3167	
3291	K.000	10:52–11:07 a.m.	40$_5$	32 22.6	117 19.5	185		
3292	000e	10:52–11:07 a.m.	40$_5$	32 22.6	117 19.5	0	3168	
				April 26, 1912				
3293	N.0	3:20 a.m.	40$_5$	32 23.5	117 18.0	145–92		For water samples
3294	000e	3:30–5:10 a.m.	40$_{4-5}$	From 3:00 to 5:10		0	3174	corresponding
3295	12	3:30–5:10 a.m.	40$_{4-5}$	a.m. the boat		0	3174	to N.0 hauls
				drifted from the				see p. 171
3296	20	3:30–5:10 a.m.	40$_{4-5}$	above position		0	3174	Dark until dawn
3297	N.0	3:55 a.m.	40$_4$	to the following		92–73		at 4:20 a.m.
3298	N.0	4:05 a.m.	40$_4$	position		73–55		Cloudy through-
3299	N.0	4:30 a.m.	40$_4$			55–46		out day
3300	N.0	4:40 a.m.	40$_4$			46–37		
3301	N.0	4:48 a.m.	40$_4$			37–27		
3302	N.0	4:57 a.m.	40$_4$			27–18		
3303	N.0	5:05 a.m.	40$_4$			18–9		
3304	N.0	5:10 a.m.	40$_4$	32 21.9	117 18.2	9–0		
3305	000e	5:55–7:15 a.m.	40$_5$	32 23.5	117 18.0	0	3186	
3306	12	5:55–7:15 a.m.	40$_5$	32 23.5	117 18.0	0	3186	
3307	20	5:55–7:15 a.m.	40$_5$	32 23.5	117 18.0	0	3186	
3308	N.0	6:00 a.m.	40$_5$	32 23.5	117 18.0	137–0		Struck bottom
3309	N.0	6:15 a.m.	40$_5$	32 23.5	117 18.0	92–73		
3310	N.0	6:30 a.m.	40$_5$	32 23.5	117 18.0	73–55		
3311	N.0	6:40 a.m.	40$_5$	32 23.5	117 18.0	55–46		
3312	N.0	6:45 a.m.	40$_5$	32 23.5	117 18.0	46–37		
3313	N.0	6:55 a.m.	40$_5$	32 23.5	117 18.0	37–27		
3314	N.0	7:05 a.m.	40$_5$	32 23.5	117 18.0	27–18		
3315	N.0	7:10 a.m.	40$_5$	32 23.5	117 18.0	18–9		
3316	N.0	7:15 a.m.	40$_5$	32 23.5	117 18.0	9–0		
3317	000e	8:45–10:10 a.m.	40$_5$	32 22.7	117 19.2	0	3199	
3318	12	8:45–10:10 a.m.	40$_5$	From 8:45 to 10:10		0	3199	
3319	20	8:45–10:10 a.m.	40$_5$	a.m. the boat		0	3199	
3320	N.0	9:00 a.m.	40$_5$	drifted from the		137–92		
3321	N.0	9:10 a.m.	40$_5$	above position		92–0		
3322	N.0	9:20 a.m.	40$_5$	to the following		92–73		
3323	N.0	9:30 a.m.	40$_5$	position		73–55		
3324	N.0	9:35 a.m.	40$_5$			55–46		
3325	N.0	9:45 a.m.	40$_5$			46–37		
3326	N.0	9:55 a.m.	40$_5$			37–27		

Table 5.—Data Relative to Plankton Hauls—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				April 26, 1912				
3327	N.0	10:00 a.m.	40_5			27–18	....	
3328	N.0	10:05 a.m.	40_5			18–9	....	
3329	N.0	10:10 a.m.	40_5	32° 23′4	117 19′0	9–0	.....	
				July 17, 1912				
3330	S.20	6:10 a.m.	(39_9)	32 43.2	117 16.7	22–0	.....	Taken in middle of kelp
3331	S.20	6:30 a.m.	(39_9)	32 43.0	117 16.0	11–0	3217	Between kelp and shore
3332	S.20	7:45 a.m.	(39_9)	32 43.5	117 17.1	37–0	3223, 3224	On outer edge of kelp
3333	S.20	8:40 a.m.	40_9	32 43.7	117 18.3	61–0	3225, 3226	
3334	S.20	9:15 a.m.	40_9	32 44.1	117 20.0	76–0	3227, 3228	
3335	S.20	10:10 a.m.	40_9	32 44.5	117 21.6	92–0	3235, 3236	
				July 22, 1912				
3336	S.20	6:10 a.m.	(39_9)	32 43.2	117 16.7	22–0	3247	Taken in middle of kelp
3337	S.20	6:30 a.m.	(39_9)	32 43.0	117 16.0	11–0	3248	Between kelp and shore
3338	S.20	7:30 a.m.	(39_9)	32 43.5	117 17.1	37–0	3252	Outer edge of kelp
3339	S.20	8:30 a.m.	40_9	32 43.7	117 18.3	61–0	3253, 3254	
3340	20	9:00–9:12 a.m.	40_9	32 44.1	117 20.0	0	3255	
3341	S.20	9:01 a.m.	40_9	32 44.1	117 20.0	70 0	3255, 3256	
3342	20	9:30–9:45 a.m.	40_9	32 44.5	117 21.6	0	3257	
3343	S.20	9:32 a.m.	40_9	32 44.5	117 21.6	92–0	3257, 3258	
3344	20	10:20–10:45 a.m.	41_9	32 45.0	117 24.1	0	3259	
3345	S.20	10:22 a.m.	41_9	32 45.0	117 24.1	355–0	3259, 3260	
3346*	20	....	41_9	32 45.5	117 26.4	0	3262	
3348	K.20	5:56 6:06 p.m.	B	32 42.6	117 13.55	7	3264, 3265	
3349	20	5:56–6:06 p.m.	B	32 42.6	117 13.55	0	3263	
3350	20	8:15–8:23 p.m.	B	32 42.4	117 10.6	0	3266	
3351	20	8:25 p.m.	B	32 42.4	117 10.6	13–0	.....	
				July 24, 1912				
3352	K.20	5:20–5:25 a.m.	40_5	32 22.4	117 21.2	5	3277, 3278	See Appendix II for information relative to the distance covered by K.20 hauls
3353	20	5:21–5:26 a.m.	40_5	4:40 to 6:50 drifted		0	.....	
3354	K.20	5:45–5:50 a.m.	40_5	from above to following position		9	3279, 3280	
3356	K.20	6:05 6:10 a.m.	40_5			18	3282, 3283	
3357	K.20	6:21–6:26 a.m.	40_5	32 22.8	117 19.7	27	3284, 3285	
3358	20	7:35–9:00 a.m.	40_4	32 22.4	117 21.2	0	3291, 3296	
3359	K.20	7:37–7:42 a.m.	40_4	7:35 to 9:50 drifted		46	3287, 3288	
3360	K.20	7:55–8:00 a.m.	40_4	from above to following position		55	3289, 3290	
3361	K.20	8:20–8:25 a.m.	40_4			92	3292, 3293	
3362	K.20	8:45–8:50 a.m.	40_4			46	3294, 3295	
3363	20	9:05–9:45 a.m.	40_4	32 22.2	117 19.3	0	3296	
3364	K.20	10:10–10:15 a.m.	40_4	32 22.4	117 21.2	137	3300, 3301	
3365	20	10:12–11:35 a.m.	40_4	10:05 to 11:43 drifted		0	3304	
3366	K.20	10:35–10:40 a.m.	40_4	from above to following position		185	3302, 3303	
3367	K.20	11:10–11:15 a.m.	40_4	32 22.5	117 19.15	275	3305, 3306	
3368	K.20	1:30–1:35 p.m.	40_4	32 22.4	117 21.2	365	3311, 3312	On position 12:01
3369	K.20	1:55–2:00 p.m.	40_4	32 21.4	117 19.0	27	3313, 3314	Drifted to position at 2:48 p.m.
				July 25, 1912				
3370†	K.20	4:35–4:40 a.m.	40_4	32 22.4	117 21.2	55	3335, 3336	
3371†	K.20	4:50–4:55 a.m.	40_4	4:07 to 5:45 drifted		73	3337, 3338	
3372	20	4:55 5:40 a.m.	40_4	from above to following position		0	3339	
3373	K.20	5:20 5:25 a.m.	40_4	32 21.3	117 19.4	73	3340, 3341	
3374	20	6:00 8:00 a.m.	40_4	32 22.4	117 21.2	0	3342, 45, 46	
3375	K.20	8:35–8:40 a.m.	40_4	6:00 to 9:50 drifted		275	3347, 3348	
3376	20	8:40–8:50 a.m.	40_4	from above to following position		0	.....	Part of haul 3376 lost on account of leak in net bucket
3377	K.20	9:20–9:25 a.m.	40_4	32 21.45	117 19.4	365	3350, 3351	
3378	K.20	11:15–11:20 a.m.	40_4	32 22.4	117 21.2	5	3355, 3356	
3379	K.20	11:30–11:35 a.m.	40_4	10:30 to 12:26 drifted		9	3357, 3358	
3380	20	11:25–11:59 a.m.	40_4	from above to following position		0	.....	
3381	K.20	11:45–11:50 a.m.	40_4			18	3359, 3360	

* Haul began at 11:30 a.m. and ended at 12:30 p.m.

† Opening and closing jaws of net probably reversed at the same time.

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				July 24, 1912				
3382	K.20	12:01–12:06 p.m.	40,			27	3361, 3362	
3383	K.20	12:12–12:17 p.m.	40,	32° 22.3	117° 18.4	37	3364, 3365	
3385*	20	1:00–1:40 p.m.	40,	32 22.4	117 21.2	0	3372	
3386*	K.20	1:15–1:20 p.m.	40,	32 22.4	117 21.2	55	3368, 3369	
3387*	K.20	1:30–1:35 p.m.	40,	32 22.4	117 21.2	73	3370, 3371	
				July 26, 1912				
3388	K.20	4:27–4:32 a.m.	40,	32 22.4	117 21.2	185	3389, 3390	
3389	K.20	5:00–5:05 a.m.	40,	4:05 to 6:37 drifted		275	.....	Net failed to close
3390	20	5:00–6:30 a.m.	40,	from above to fol-		0	3391, 3393	
3391	K.20	5:40–5:45 a.m.	40,	lowing position		275	3392	
3392	K.20	6:20–6:25 a.m.	40,	32 22.05	117 20.9	137	3394, 3395	
3393	20	6:55 8:30 a.m.	40,	32 22.4	117 21.2	0	3397, 3400	
3394	K.20	7:05–7:10 a.m.	40,	From 6:50 to 9:47		365	3396	Net failed to close
3395	K.20	7:45 7:50 a.m.	40,	a.m. the boat		5	3398, 3399	Net failed to close
3396	K.20	8:45–8:50 a.m.	40,	drifted from the		9	3401, 3402	
3397	20	9:00 9:05 a.m.	40,	above position		0	3403	
3398	K.20	9:00–9:05 a.m.	40,	to the following		18	3404, 3405	
3399	20	9:10 9:40 a.m.	40,	position		0	.....	
3400	K.20	9:15–9:20 a.m.	40,			27	3406, 3407	
3401	K.20	9:30–9:35 a.m.	40,	32 21.95	117 19.5	37	3408, 3409	
3402	K.20	10:07–10:12 a.m.	40,	32 22.4	117 21.2	46	3410, 3411	
3403†	20	.....	40, 5	10:05 to 12:14 drifted		0	3412, 15, 20	
3404	K.20	10:27–10:32 a.m.	40, 5	from above to fol-		55	3413, 3414	
3405	K.20	11:30–11:35 a.m.	40,	lowing position		73	3416, 3417	
3406	K.20	11:54–11:59 a.m.	40,	32 23.3	117 19.0	92	3418, 3419	
				July 27, 1912				
3407	K.20	5:45–5:50 a.m.	40,	32 22.4	117 21.2	92	3441	
3408	20	5:48–7:25 a.m.	40,	From 5:20 to 7:33		0	3442, 3449	
3409	K.20	6:07–6:12 a.m.	40,	a.m. drifted from		46	3443, 3444	
3410	K.20	6:25–6:30 a.m.	40,	above to follow-		37	3445, 3446	
3411	K.20	6:45–6:50 a.m.	40,	ing position		185	3447, 3448	
3412	K.20	7:10–7:15 a.m.	40,	32 22.15	117 19.55	137	.....	Net failed to close
3413	K.20	8:09–8:14 a.m.	40,	32 22.4	117 21.2	137	3451, 3452	On position 7:45
3414	20	8:10–8:50 a.m.	40,	32 21.7	117 19.6	0	3450, 3453	Drifted to posi-
3415	20	9:25–9:55 a.m.	40,	32 22.4	117 21.2	0	3455	tion at 8:58
3416	K.20	9:40–9:46 a.m.	40,	9:22 to 12:08 drifted		550	3454	a.m.
3417	20	10:00–10:05 a.m.	40,	from above to fol-		0	.....	
3418	20	10:07–11:59 a.m.	40,	lowing position		0	3457	
3419	K.20	10:40–10:45 a.m.	40,			18	3456	
3420	K.20	11:40–11:45 a.m.	40,	32 21.35	117 20.5	275	3458, 3459	
3421	20	12:40–1:00 p.m.	40,	32 22.3	117 21.4	0	3460	
3422	20	6:15–6:25 p.m.	39,	32 24.4	117 14.3	0	.....	Hauls 3422–3433
3423	20	7:00–7:10 p.m.	39,	32 24.4	117 14.3	0	3473	made while the
3424	20	8:10–8:20 p.m.	39,	32 24.4	117 14.3	0	.....	boat lay at
3425	20	9:00–9:10 p.m.	39,	32 24.4	117 14.3	0	3474	anchor
3426	20	10:00–10:20 p.m.	39,	32 24.4	117 14.3	0	.....	
3427	20	11:15–11:25 p.m.	39,	32 24.4	117 14.3	0	.....	
				July 28, 1912				
3428	20	12:01–12:16 a.m.	39,	32 24.4	117 14.3	0	.....	
3429	20	1:00–1:10 a.m.	39,	32 24.4	117 14.3	0	3475	
3430	20	3:05–3:15 a.m.	39,	32 24.4	117 14.3	0	.....	
3431	20	5:10–5:20 a.m.	39,	32 24.4	117 14.3	0	3476	
3432	20	7:55–8:10 a.m.	39,	32 24.4	117 14.3	0	3477	
3433	20	9:10 a.m.	39,	32 24.4	117 14.3	11–0	.....	
3434	K.20	8:10–8:15 p.m.	40,	32 22.4	117 21.2	5	3478, 3479	Part of haul 3434
3435	20	8:15–9:35 p.m.	40,	From 8:00 to 10:24		0	3480	lost in con-
3436‡	K.20	8:26–8:31 p.m.	40,	a.m. the boat		9	3481, 3482	densing
3437	K.20	8:40–8:45 p.m.	40,	drifted from the		18	3483	Net failed to close
3438	K.20	8:52–8:58 p.m.	40,	above position		27	3484, 3485	
3439	K.20	9:10–9:15 p.m.	40,	to the following		37	.....	Net failed to close
3440	K.20	9:25–9:30 p.m.	40,	position		37	.....	Net failed to close

* From 12:55 to 1:50 p.m. the boat drifted from the position entered to 32° 22.4 N 117° 19.8 W.

† Haul began at 10:10 a.m. and ended at 12:10 p.m.

‡ Opening and closing jaws of net probably reversed at the same time.

Table 5.—Data Relative to Plankton Hauls—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				July 28, 1912				
3441	K.20	9:40–9:45 p.m.	40$_4$			37	.....	Net failed to close
3442	20	9:42–10:20 p.m.	40$_4$	32° 20.75	117° 19.2	0	3486	
3443	K.20	10:45–10:50 p.m.	40$_4$	32 21.75	117 20.6	37	3487, 3488	
3444	20	10:47 11:45 p.m.	40$_4$	10:38 p.m. to 1:45		0	3489	
3445	K.20	11:00–11:05 p.m.	40$_4$	a.m. drifted from		46	.....	Net failed to close
3446	K.20	11:15–11:20 p.m.	40$_4$	above to follow-		46	3490	
3447	K.20	11:35–11:40 p.m.	40$_4$	ing position		55	3491	
				July 29, 1912				
3448	20	12:01–1:31 a.m.	40$_4$			0	3495	
3449	K.20	12:10–12:15 a.m.	40$_4$			73	3492, 3493	
3450	K.20	12:25–12:30 a.m.	40$_4$			92	3494	
3451*	K.20	12:50–12:55 a.m.	40$_4$	32 19.95	117 19.0	137	3496, 3497	
3452†	20	2:10–3:40 a.m.	40$_4$	32 21.65	117 21.0	0	3501, 3506	
3453*†	K.20	2:55–3:01 a.m.	40$_4$	32 21.65	117 21.0	185	3502, 3503	
3454†	K.20	3:30–3:35 a.m.	40$_4$	32 21.65	117 21.0	275	3504, 3505	
3455	K.20	8:07–8:12 p.m.	40$_4$	32 22.4	117 21.2	46	3507, 3508	
3456	20	8:15–9:50 p.m.	40$_4$	From 7:58 to 10:30		0	3509	
3457a	K.B.	9:30 p.m.	40$_4$	p.m. the boat		5	3510	In all K.B. hauls
3457b	K.B.	9:35 p.m.	40$_4$	drifted from the		5	.....	the 5 gallons of
3458a	K.B.	9:42 p.m.	40$_4$	above position		9	3511	water was
3458b	K.B.	9:47 p.m.	40$_4$	to the following		9	.....	filtered through
3459a	K.B.	9:55 p.m.	40$_4$	position		18	3512	No. 20 netting.
3459b	K.B.	10:00 p.m.	40$_4$			18	.....	From 3457a to
3460a	K.B.	10:07 p.m.	40$_4$			27	3513	3473c those
3460b	K.B.	10:20 p.m.	40$_4$			27	.....	numbered a and
3461	20	10:10–10:25 p.m.	40$_4$	32 21.8	117 19.75	0	3514	b, or a, b, and
3462a	K.B.	10:45 p.m.	40$_5$	32 23.0	117 20.8	37	3515	c, were com-
3462b	K.B.	10:50 p.m.	40$_5$	From 10:45 to 11:55		37	.....	bined and ac-
3463	20	10:55–11:50 p.m.	40$_5$	p.m. the boat		0	.....	cessioned under
3464a	K.B.	11:00 p.m.	40$_5$	drifted from the		46	3516	one number;
3464b	K.B.	11:07 p.m.	40$_5$	above position		46	.....	thereafter each
3465a	K.B.	11:15 p.m.	40$_5$	to the following		55	3517	haul was pre-
3465b	K.B.	11:22 p.m.	40$_5$	position		55	.....	served separ-
3466a	K.B.	11:32 p.m.	40$_5$			73	3518	ately
3466b	K.B.	11:42 p.m.	40$_5$	32 22.55	117 20.25	73	.....	
				July 30, 1912				
3467a	K.B.	12:10 a.m.	40$_5$	32 23.75	117 20.75	92	3519	
3467b	K.B.	12:17 a.m.	40$_5$	From 12:05 to 2:20		92	.....	
3468	20	12:12–1:55 a.m.	40$_5$	a.m. the boat		0	3521, 3524	
3469a	K.B.	12:29 a.m.	40$_5$	drifted from the		137	3520	
3469b	K.B.	12:40 a.m.	40$_5$	above position		137	.....	
3469c	K.B.	12:50 a.m.	40$_5$	to the following		137	.....	
3470a	K.B.	1:00 a.m.	40$_5$	position		185	3522	
3470b	K.B.	1:15 a.m.	40$_5$			185	.....	
3470c	K.B.	1:30 a.m.	40$_5$			185	.....	
3471a	K.B.	1:45 a.m.	40$_5$			275	3523	
3471b	K.B.	2:00 a.m.	40$_5$			275	.....	
3471c	K.B.	2:15 a.m.	40$_5$			275	.....	
3472	20	1:55–2:15 a.m.	40$_5$	32 22.9	117 19.7	0	3524	
3473a‡	K.B.	2:50 a.m.	40$_5$	32 24.75	117 20.0	365	3525	
3473b‡	K.B.	3:12 a.m.	40$_5$	32 24.75	117 20.0	365	.....	
3473c‡	K.B.	3:33 a.m.	40$_5$	32 24.75	117 20.0	365	.....	
3474a	K.B.	7:53 p.m.	40$_4$	32 22.4	117 21.2	55	.....	
3474b	K.B.	8:00 p.m.	40$_4$	From 5:50 to 11:46		55	3528	
3475	20	8:00–8:55 p.m.	40$_4$	p.m. the boat		0	3532	
3476a	K.B.	8:07 p.m.	40$_4$	drifted from the		73	3529	
3476b	K.B.	8:17 p.m.	40$_4$	above position		73	.....	
3477a	K.B.	8:25 p.m.	40$_4$	to the following		92	3530	
3477b	K.B.	8:32 p.m.	40$_4$	position		92	.....	
3478a	K.B.	8:42 p.m.	40$_4$			137	3531	
3478b	K.B.	8:53 p.m.	40$_4$			137	.....	

* Opening and closing jaws of net probably reversed at the same time.

† From 2:02 to 4:05 a.m. the boat drifted from the position entered to 32° 21.1 N 117° 19.5 W.

‡ From 2:28 to 3:58 a.m. the boat drifted from the position entered to 32° 23.25 N 117° 18.8 W.

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				July 30, 1912				
3479	20	8:57–9:55 p.m.	40₄			0	3532, 3535	
3480a	K.B.	9:05 p.m.	40₄			185	3533	
3480b	K.B.	9:15 p.m.	40₄			185	.....	
3481a	K.B.	9:32 p.m.	40₄			275	3534	
3481b	K.B.	9:50 p.m.	40₄			275	.....	
3482	20	9:56–10:55 p.m.	40₄			0	3535, 3538	
3483a	K.B.	10:07 p.m.	40₄			365	3536	
3483b	K.B.	10:25 p.m.	40₄			365	.....	
3484a	K.B.	10:50 p.m.	40₄			550	3537	
3484b	K.B.	11:15 p.m.	40₄			550	.....	
3485	20	11:00–11:45 p.m.	40₄	32° 21.75	117° 19.0	0	.....	
				July 31, 1912				
3486	20	12:05–1:05 a.m.	40₄	32 22.4	117 20.0	0	3539, 3543	
3487a	K.B.	12:10 a.m.	40₄	From 12:01 to 2:20		275	3540	
3487b	K.B.	12:20 a.m.	40₄	a.m. the boat		275	.....	
3488a	K.B.	12:42 a.m.	40₄	drifted from the		185	3541	
3488b	K.B.	12:55 a.m.	40₄	above position		185	.....	
3489a	K.B.	1:07 a.m.	40₄	to the following		5	3542	
3489b	K.B.	1:12 a.m.	40₄	position		5	.....	
3490	20	1:10–2:10 a.m.	40₄			0	3543, 3549	
3491a	K.B.	1:17 a.m.	40₄			9	3544	
3491b	K.B.	1:22 a.m.	40₄			9	.....	
3492a	K.B.	1:27 a.m.	40₄			18	.....	
3492b	K.B.	1:31 a.m.	40₄			18	3545	
3493a	K.B.	1:37 a.m.	40₄			27	3546	
3493b	K.B.	1:45 a.m.	40₄			27	.....	
3494a	K.B.	1:50 a.m.	40₄			37	3547	
3494b	K.B.	1:57 a.m.	40₄			37	.....	
3495a	K.B.	2:02 a.m.	40₄			46	3548	
3495b	K.B.	2:07 a.m.	40₄			46	.....	
3496	20	2:12–2:20 a.m.	40₄			0	3549	
3497a	K.B.	2:14 a.m.	40₄	32 21.75	117 19.0	55	3550	
3497b	K.B.	2:36 a.m.	40₅	32 23.0	117 19.4	55	.....	
3498	20	2:37–3:27 a.m.	40₅	From 2:35 to 3:37		0	3554	
3499a	K.B.	2:43 a.m.	40₅	a.m. the boat		73	3551	
3499b	K.B.	2:50 a.m.	40₅	drifted from the		73	.....	
3500a	K.B.	2:58 a.m.	40₅	above position		92	3552	
3500b	K.B.	3:07 a.m.	40₅	to the following		92	.....	
3501a	K.B.	3:15 a.m.	40₅	position		137	3553	
3501b	K.B.	3:25 a.m.	40₄	32 22.3	117 18.7	137	.....	
				August 1, 1912				
3502a*	K.B.	8:00 a.m.	40₄	32 22.4	117 21.2	550	3555	
3502b*	K.B.	8:22 a.m.	40₄	32 22.4	117 21.2	550	.....	
3503*	20	8:05–8:35 a.m.	40₄	32 22.4	117 21.2	0	3556	
3504a	K.B.	1:44 p.m.	40₄	32 22.4	117 21.2	275	3561	
3504b	K.B.	1:58 p.m.	40₄	From 1:40 to 3:15		275	.....	
3505	20	2:00–2:50 p.m.	40₄	p.m. the boat		0	3562	
3506a	K.B.	2:13 p.m.	40₄	drifted from the		185	3563	
3506b	K.B.	2:25 p.m.	40₄	above position		185	.....	
3507a	K.B.	2:38 p.m.	40₄	to the following		137	3564	
3507b	K.B.	2:45 p.m.	40₄	position		137	.....	
3508	20	2:52–3:12 p.m.	40₄			0	3566	
3509a	K.B.	2:55 p.m.	40₄			92	3565	
3509b	K.B.	3:05 p.m.	40₄	32 21.95	117 19.2	92	.....	
3510a	K.B.	3:45 p.m.	40₄	32 22.4	117 21.2	37	3567	
3510b	K.B.	3:51 p.m.	40₄	From 3:42 to 5:17		37	.....	
3511	20	3:51–5:15 p.m.	40₄	p.m. the boat		0	3569, 3572	
3512a	K.B.	3:57 p.m.	40₄	drifted from the		18	3568	
3512b	K.B.	4:02 p.m.	40₄	above position		18	.....	
3513a	K.B.	4:07 p.m.	40₄	to the following		365	3570	
3513b	K.B.	4:25 p.m.	40₄	position		365	.....	
3514a	K.B.	4:45 p.m.	40₄			275	3571	
3514b	K.B.	5:02 p.m.	40₄	32 21.7	117 19.8	275	.....	
3515a	K.B.	5:37 p.m.	40₄	32 22.4	117 21.2	185	3573	

* From 7:56 to 8:58 a.m. the boat drifted from the position entered to 32° 22.45 N 117° 20.5 W.

Table 5.—Data Relative to Plankton Hauls—(*Continued*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Water sample number	Remarks
				August 17, 1910				
3515b	K.B.	5:50 p.m.	40,	From 5:35 to 7:49		185	.....	
3516a	K.B.	6:02 p.m.	40,	p.m. the boat		137	3574	
3516b	K.B.	6:10 p.m.	40,	drifted from the		137	.....	
3517	20	6:11–6:29 p.m.	40,	above position		0	3575	
3518a	K.B.	6:20 p.m.	40,	to the following		92	3576	
3518b	K.B.	6:27 p.m.	40,	position		92	.....	
3519	20	6:30–7:35 p.m.	40,			0	3579	
3520a	K.B.	6:35 p.m.	40,			73	3577	
3520b	K.B.	6:45 p.m.	40,			73	.....	
3521a	K.B.	6:53 p.m.	40,			55	3578	
3521b	K.B.	6:58 p.m.	40,			55	.....	
3522a	K.B.	7:10 p.m.	40,			365	3580	
3522b	K.B.	7:30 p.m.	40,	32° 21.2	117° 17.9	365	.....	
				August 2, 1912				
3523a	K.B.	1:28 p.m.	40,	32 22.4	117 21.2	5	3581	
3523b	K.B.	1:35 p.m.	40,	From 1:28 to 2:40		5	.....	
3524	20	1:35–2:05 p.m.	40,	p.m. boat drifted		0	3582	
3525a	K.B.	1:40 p.m.	40,	from above posi-		9	3583	
3525b	K.B.	1:45 p.m.	40,	tion to follow-		9	.....	
3526a	K.B.	1:50 p.m.	40,	ing position		550	3584	
3526b	K.B.	2:15 p.m.	40,	32 22.0	117 20.0	550	.....	Probably closed
3527a*	K.B.	3:30 p.m.	40,	32 22.4	117 21.2	735	3585	near the surface
3527b*	K.B.	4:15 p.m.	40,	32 22.4	117 21.2	735	.....	
3528a*	K.B.	4:45 p.m.	40,	32 22.4	117 21.2	46	3588	
3528b*	K.B.	4:52 p.m.	40,	32 22.4	117 21.2	46	.....	
3529a	K.B.	5:20 p.m.	40,	32 22.7	117 20.6	37	3589	
3529b	K.B.	5:27 p.m.	40,	From 5:20 to 6:10		37	.....	
3530	20	5:30–6:05 p.m.	40,	p.m. the boat		0	3591, 3595	
3531a	K.B.	5:32 p.m.	40,	drifted from the		27	3590	
3531b	K.B.	5:38 p.m.	40,	above position		27	.....	
3532a	K.B.	5:43 p.m.	40,	to the following		18	3592	
3532b	K.B.	5:46 p.m.	40,	position		18	.....	
3533a	K.B.	5:50 p.m.	40,			9	3593	
3533b	K.B.	5:55 p.m.	40,			9	.....	
3534a	K.B.	6:00 p.m.	40,			5	3594	
3534b	K.B.	6:05 p.m.	40,	32 21.75	117 20.0	5	.....	
				August 3, 1912				
3535a	K.B.	6:15 a.m.	40,	32 22.4	117 20.5	550	3596	
3535b	K.B.	6:40 a.m.	40,	From 6:07 to 8:21		550	.....	
3536	20	6:40–7:50 a.m.	40,	a.m. the boat		0	3597, 3601	
3537a	K.B.	6:58 a.m.	40,	drifted from the		5	.....	
3537b	K.B.	7:02 a.m.	40,	above position		5	3598	
3538a	K.B.	7:35 a.m.	40,	to the following		9	3599	
3538b	K.B.	7:40 a.m.	40,	position		9	.....	
3539a	K.B.	7:45 a.m.	40,			18	3600	
3539b	K.B.	7:50 a.m.	40,			18	.....	
3540	20	7:52–8:15 a.m.	40,			0	3601	
3541a	K.B.	7:55 a.m.	40,			27	3602	
3541b	K.B.	8:00 a.m.	40,			27	.....	
3542a	K.B.	8:06 a.m.	40,			37	3603	
3542b	K.B.	8:12 a.m.	40,	32 21.6	117 20.45	37	.....	
3543a	K.B.	8:40 a.m.	40,	32 22.4	117 21.2	46	3604	
3543b	K.B.	8:45 a.m.	40,	From 8:40 to 10:53		46	.....	
3544	20	8:45–9:26 a.m.	40,	a.m. the boat		0	.....	
3545a	K.B.	8:52 a.m.	40,	drifted from the		55	3605	
3545b	K.B.	8:58 a.m.	40,	above position		55	.....	
3546a	K.B.	9:05 a.m.	40,	to the following		92	3606	
3546b	K.B.	9:12 a.m.	40,	position		92	.....	
3547a	K.B.	9:17 a.m.	40,			185	3607	
3547b	K.B.	9:25 a.m.	40,			185	.....	
3548	20	9:30–10:45 a.m.	40,			0	3610	
3549a	K.B.	9:45 a.m.	40,			365	3608	
3549b	K.B.	10:00 a.m.	40,			365	.....	
3550	K.B.	10:20 a.m.	40,	32 21.9	117 18.55	550	3609	Struck bottom

* From 3:00 to 5:00 p.m. the boat drifted from the position entered to 32° 21.5 N 117° 19.1 W.

TABLE 5.—DATA RELATIVE TO PLANKTON HAULS—(*Concluded*)

Part B—Plankton Collections of Quantitative Significance

Haul number	Apparatus used	Time of day and duration of haul	Section	Position		Depth in meters	Water sample number	Remarks
				N lat.	W long.			
				August 4, 1912				
3551	20	7:00–7:10 p.m.	B	32° 42.4	117° 10.6	0	B.487	
3552	20	8:00–8:15 p.m.	B	32 42.4	117 10.6	0	B.488	
3553	20	9:00–9:15 p.m.	B	32 42.4	117 10.6	0	B.489	
3554	20	10:00–10:15 p.m.	B	32 42.4	117 10.6	0	B.490	
3555	20	11:05–11:25 p.m.	B	32 42.4	117 10.6	0	B.491	
				August 5, 1912				
3556	20	12:01–12:16 a.m.	B	32 42.4	117 10.6	0	B.492	
3557	20	1:00–1:15 a.m.	B	32 42.4	117 10.6	0	B.493	
3558	20	3:05–3:20 a.m.	B	32 42.4	117 10.6	0	B.494	
3559	20	5:05–5:20 a.m.	B	32 42.4	117 10.6	0	B.495	
3560	20	7:10 7:25 a.m.	B	32 42.4	117 10.6	0	B.496	
				August 18, 1912				
3561	000e	11:45–11:55 a.m.	(80_{58})	35 8.25	120 38.7	0	3618	
3562	12	11:45 11:55 a.m.	(80_{58})	35 8.25	120 38.7	0	3618	
3563	000e	4:45–4:55 p.m.	(83_{41})	35 26.2	120 55.0	0	3623	
3564	12	4:45–4:55 p.m.	(83_{41})	35 26.2	120 55.0	0	3623	
				August 19, 1912				
3565	000e	5:28–5:38 a.m.	84_{41}	35 27.0	121 0.1	0	3625	
3566	12	5:28–5:38 a.m.	84_{41}	35 27.0	121 0.1	0	3625	
3567	000e	6:03–6:13 p.m.	95_{-6}	36 38.3	121 57.0	0	3638	
3568	12	6:03–6:13 p.m.	95_{56}	36 38.3	121 57.0	0	3638	
				August 20, 1912				
3569	000e	12:01–12:13 p.m.	$(101)_{63}$	37 16.0	122 25.9	0	3646	
3570	12	12:01–12:13 p.m.	$(101)_{63}$	37 16.0	122 25.9	0	3646	
				August 24, 1912				
3571	000e	8:14–8:24 a.m.	(107_{72})	37 58.5	122 56.7	0	3657	
3572	12	8:14–8:24 a.m.	(107_{72})	37 58.5	122 56.7	0	3657	
3573	000e	12:15–12:25 p.m.	(109_{76})	38 17.7	123 4.1	0	3661	
3574	12	12:15–12:25 p.m.	(109_{76})	38 17.7	123 4.1	0	3661	
				August 25, 1912				
3575	000e	6:35–7:05 a.m.	(112_{79})	38 35.7	123 21.7	0	3670	
3576	12	6:35–7:05 a.m.	(112_{79})	38 35.7	123 21.7	0	3670	
				August 26, 1912				
3577	000e	7:15–7:25 a.m.	$(118)_{90}$	39 29.2	123 49.2	0	.....	
3578	12	7:15 7:25 a.m.	$(118)_{90}$	39 29.2	123 49.2	0	.....	
				August 28, 1912				
3579	12	6:50 7:01 a.m.	125_{105}	40 46.5	124 24.8	0	3686	
3580	.....	.....	125_{105}	40 46.5	124 24.8	0	.....	Dip-net haul in "red water"
3581	.....	.....	125_{105}	40 46.5	124 24.8	0	.....	
3582	.....	.....	125_{105}	40 46.5	124 24.8	0	.....	
3583	000e	2:50–3:00 p.m.	(122_{117})	41 44.2	124 11.8	0	3694	In "red water"
3584	12	2:50–3:00 p.m.	(122_{117})	41 44.2	124 11.8	0	3694	In "red water"
				August 29, 1912				
3585	.....	.....	126_{129}	42 44.0	124 30.5	0	.....	Dip-net haul
3586	000e	3:13 3:23 p.m.	126_{129}	42 44.0	124 30.5	0	3705	
3587	12	3:13–3:23 p.m.	126_{129}	42 44.0	124 30.5	0	3705	
3588	.....	.....	126_{129}	42 44.0	124 30.5	0	.....	Dip-net haul
				September 6, 1912				
3589	12	9:00 9:10 a.m.	(118_{170})	46 11.5	123 51.0	0	3722	Haul 3589 to 3590 were made in Columbia River near Astoria
				September 8, 1912				
3590	12	9:00 9:10 a.m.	(118_{170})	46 11.5	123 51.0	0	3726	
				September 10, 1912				
3591	12	6:00–6:10 a.m.	128_{191}	47 55.0	124 41.0	0	3736	
3592	12	1:00–1:10 p.m.	$(127_{196.5})$	48 22.5	124 36.0	0	3743	
3593	.....	.....	$(127_{196.5})$	48 22.5	124 36.0	0	.....	Dip-net haul
				September 11, 1912				
3594	12	8:00–8:10 a.m.	130_{194}	48 10.0	124 49.2	0	3747	
				September 12, 1912				
3595	12	10:00–10:05 a.m.	(120_{171})	45 26.5	124 0.0	0	3767	

EXPLANATION OF TABLE 6, PART A

This part includes the field data relative to all the dredge hauls and shore collections accessioned under Roman numerals. The collections were made during 1901 (see p. 6) under the supervision of C. A. Kofoid, assisted by W. J. Raymond, the former Professor of Zoology and the latter Associate Professor of Physics in the University of California.

First column.—Numbers under which the collections were accessioned; the left part of the double number denotes the station occupied and the right part the haul made; the numbers are arranged first according to station, second according to haul.

Second column.—Date.

Third column.—Time at which haul began entered to the nearest minute.

Fourth column.—Duration of haul entered to the nearest minute.

Fifth column.—Section; for explanation see page 46.

Sixth and seventh columns.—Latitude and longitude of beginning and end of haul; when both are entered they are probably accurate to 0.3 miles, but where only a single entry is given the error is in most cases more than 0.5 miles.

Eighth column.—Depth of bottom at beginning and end of haul entered to the nearest meter above and to the nearest five below 120 meters; brackets indicate that the sounding was determined from the charted position.

Ninth column.—Character of bottom denoted by the symbols adopted by the United States Coast and Geodetic Survey (see Appendix IV); miscellaneous remarks relative to the hauls.

TABLE 6.—DATA RELATIVE TO DREDGE HAULS

Part A—Dredge Hauls made during 1901

Haul number	Date 1901	Time of day	Duration in minutes	Section	Latitude N Begin	Latitude N End	Longitude W Begin	Longitude W End	Depth in meters	Character of bottom and remarks
					33°		118°			
I–1	May 22	10:00 a.m.	20	52_{20}	41.8	.....	17.8	.....	18	gy. S. M.
I–2	May 22	11:00 a.m.	15	52_{20}	42.0	.....	17.9	.....	18	dk. br. M. S.
I–3	June 13	11:45 a.m.	.....	51.5_{20}	41.4	41.6	18.8	16.3	46–24	Net torn
II–1	May 23	9:00 a.m.	15	(51_{21})	43.8	.....	15.8	.....	4	Quantities of seaweed
II–2	May 23	12:01 p.m.	20	(51_{21})	43.7	.....	15.6	.....	5	Quantities of seaweed
III	May 24	8:30 a.m.	10	$50_{(21)}$	44.7	.....	11.4	.....	13	dk. br. M.
III¹-1	May 24	9:30 a.m.	15	$50_{(21)}$	43.0	.....	11.6	.....	36	fne. gy. S.
IV–1	May 24	11:00 a.m.	.....	(51_{21})	43.3	.....	16.3	.....	5	S. Sh.
IV–2	May 24	11:30 a.m.	.....	(51_{21})	43.3	.....	16.3	.....	5	S. Sh.
IV–3	May 24	12:01 p.m.	.....	(51_{21})	43.3	.....	16.3	.....	5	S. Sh.
V–1	May 27	8:30 a.m.	20	51_{20}	42.3	.....	17.2	.....	20–29	
V–2	May 27	9:30 a.m.	25	51_{20}	42.1	.....	17.2	.....	29	
V¹-1	May 30	9:00 a.m.	20	52_{20}	42.0	41.8	19.3	17.8	44–18	gy. S. M.
V¹-2	June 8	1:00 p.m.	15	52_{20}	42.3	42.5	19.8	19.8	37–26	gy. S.
VI–1	May 27	1:00 p.m.	.....	(51_{21})	42.9	.....	16.3	.....	5	gy. S.
VI–2	May 27	1:00 p.m.	.....	(51_{21})	42.9	.....	16.3	.....	5	gy. S.
VII–1	May 28	8:20 a.m.	25	(52_{21})	43.8	.....	22.4	.....	25	
VII–2	May 28	9:10 a.m.	20	(52_{21})	43.6	.....	22.3	.....	26	
VII–3	May 28	9:50 a.m.	25	(52_{21})	.....	.....	.....	.....	84	
VIII	May 29	.....	.....	(51_{21})	47.0	.....	15.0	.....	0	M. Shore collection
IX	May 30	10:00 a.m.	25	52_{20}	.....	41.0	.....	19.8	77–(300)	
X	June 4	11:45 a.m.	25	(53_{21})	44.1	44.2	25.1	25.1	70–35	gn. M.
XI	June 4	2:40 p.m.	15	(53_{21})	46.0	45.6	26.4	26.3	64	S. M. Sh.
XII–1	June 5	10:00 a.m.	.....	(53_{22})	49.1	49.0	27.0	26.0	265–73	gn. M. S.
XII–2	June 6	7:00 a.m.	20	(53_{22})	49.2	47.7	27.0	26.5	(320)–64	bk. R. S. Sh. P.
XII¹	June 5	4:00 p.m.	15	(53_{22})	49.8	50.2	24.2	23.7	79–17	bk. M. S.
XII²	June 5	4:30 p.m.	10	(53_{22})	48.7	49.3	25.4	24.8	55–29	gn. M.S.
XIII	June 6	11:00 a.m.	20	$(53_{21.5})$	47.7	46.0	26.5	27.2	64–66	ers. S.
XIV–1	June 8	8:30 a.m.	74	52_{20}	39.4	41.4	17.8	19.1	(285)–73	sft. stk. M.
XIV–2	June 13	8:23 a.m.	147	52_{20}	38.0	41.9	17.6	19.5	(440)–46	gn. br. M. gy. S.
XIV–3	July 5	11:02 a.m.	54	52_{20}	39.4	40.6	17.8	18.5	(275)–73	gy. M.
XV	June 10	8:25 a.m.	30	(49.5_{21})	43.9	43.5	7.2	7.6	7–13	ers. S.
XV¹	June 10	9:25 a.m.	35	(49.5_{21})	43.8	42.5	7.2	10.0	8–20	ers. S.
XVI–1	June 10	11:50 a.m.	95	$(50.5_{20.5})$	41.8	42.8	11.7	13.4	24–8	S. sm. R.
XVI–2	June 11	1:00 p.m.	60	(51_{21})	42.8	.....	13.6	.....	17	sm. R. F.
XVI–3	June 12	11:15 a.m.	90	$(50.5_{20.5})$	42.0	43.3	11.6	14.4	24–13	S. sm. R.
XVII	June 11	8:45 a.m.	60	(51_{21})	.....	.....	.....	.....	7–17	fne. S.
XVII¹	June 11	10:00 a.m.	60	(51_{21})	.....	.....	.....	.....	24	fne. S.
XVIII	June 12	8:50 a.m.	90	$51_{19.5}$	36.5	39.6	14.9	14.1	60–32	S. M.
					33°		117°			
XIX–1	June 14	8:15 a.m.	60	(47_{19})	34.6	36.0	55.6	56.0	185–55	sft. M. S. P.
XIX–2	June 14	10:15 a.m.	.....	(47_{19})	34.8	36.0	55.6	56.0	140–55	sft. M. ers. S. P.
XIX–3	June 14	3:00 p.m.	.....	(47_{19})	34.8	36.0	55.6	56.0	140–55	sft. M. ers. S. P.
XIX–4	June 15	.....	.....	(47_{19})	35.1	36.0	55.6	56.0	140–55	sft. M. ers. S. P.
XIX–5	June 15	.....	.....	(47_{19})	35.1	36.0	55.6	56.0	140–55	sft. M. ers. S. P.
XX	June 15	11:05 a.m.	120	(47_{19})	34.6	35.5	55.6	55.6	185–92	
					33°		118°			
XXI–1	June 20	7:45 a.m.	130	52_{16}	21.6	23.9	18.4	21.5	103–79	gn. M. P. S.
XXI–2	June 20	10:50 a.m.	55	52_{17}	24.1	23.3	21.5	20.3	79–140	P. St.
XXI–3	June 20	3:05 p.m.	75	52_{17}	23.3	21.3	20.6	19.4	92–73	P. St.
XXI–4	June 21	10:47 a.m.	80	52_{17}	23.0	23.5	20.0	19.0	92–(290)	gn. M.
XXI–5	June 21	2:00 p.m.	.....	52_{17}	23.5	.....	19.0	.....	(290)	
XXII	June 21	9:10 a.m.	.....	51_{16}	22.0	23.0	16.7	20.0	(275)–92	
XXIII–1	June 22	7:45 a.m.	65	52_{18}	20.8	19.4	18.5	18.0	79–62	S. brk. Sh.
XXIII–2	June 22	9:10 a.m.	75	52_{18}	19.3	20.9	18.2	19.1	55–42	fne. gy. S. brk. Sh.
XXV	June 24	3:10 p.m.	27	52_{15}	17.4	17.2	18.5	18.8	90–88	gn. M. S.
XXVI	June 24	3:58 p.m.	85	52_{16}	18.0	19.6	17.5	17.9	90–84	S.
XXVII–1	June 25	8:00 a.m.	88	54_{16}	20.7	22.0	30.0	29.4	68–26	gy. S. G. sm. R.
XXVII–2	June 25	10:30 a.m.	35	54_{16}	20.5	21.8	30.0	29.5	73–29	fne. gy. S. gn. M.
XXVIII–1	June 26	.....	.....	54_{17}	26.5	26.9	29.3	29.1	22–55	ers. S. brk. Sh.
XXVIII–2	June 26	.....	.....	54_{17}	27.0	26.8	28.6	29.3	82–27	ers. S. brk. Sh.
XXIX	June 26	.....	.....	54_{17}	26.7	26.7	29.3	29.9	39–18	brk. Sh. ers. G.
XXX–1	June 26	2:00 p.m.	50	54_{18}	.....	28.0	.....	29.4	114	

Table 6.—Data Relative to Dredge Hauls—(*Continued*)

Part A—Dredge Hauls made during 1901

Haul number	Date 1901	Time of day	Duration in minutes	Section	Latitude N Begin	Latitude N End	Longitude W Begin	Longitude W End	Depth in meters	Character of bottom and remarks
					33°		118°			
XXX–2	June 26	.....	.....	$54_{17.5}$	28.0	26.6	29.5	28.5	185–73	
XXXI	June 27	9:50 a.m.	85	$54.5_{16.5}$	21.4	22.8	31.2	34.0	110–(460)	gy. M.
XXXII	June 27	1:00 p.m.	95	$54_{16.5}$	20.5	22.7	30.4	29.3	73–22	gn. M. S.
XXXIII–1	June 28	7:55 a.m.	3	54_{16}	20.3	20.3	31.5	31.5	77	R.
XXXIII–2	June 28	8:35 a.m.	15	54_{16}	20.3	20.6	31.5	31.4	77–73	brk. Sh. R.
XXXIII–3	June 28	9:00 a.m.	.....	54_{16}	21.4	.....	30.7	.....	73	
XXXIII–4	June 28	.....	.....	54_{16}	21.4	21.5	30.7	30.5	73–58	gy. M. S.
XXXIII–5	June 28	10:10 a.m.	40	54_{16}	21.2	20.6	30.6	31.4	69–73	
XXXIII–6	June 28	.....	.....	54_{16}	20.6	22.0	31.4	29.6	73–46	gy. M. S.
XXXIV	June 28	1:17 p.m.	48	54_{17}	23.0	23.0	30.9	30.0	230–165	gn. M. S.
XXXV	June 28	5:45 p.m.	75	54_{17}	25.2	25.8	30.6	30.5	55–11	gn. M.
XXXVI–1	June 29	10:50 a.m.	65	54.5_{17}	24.5	25.2	32.4	33.1	230–100	gn. M. S.
XXXVI–2	June 29	12:45 p.m.	.....	55_{17}	24.5	25.2	33.0	33.2	(275)–100	gn. M. S.
XXXVI–3	June 29	.....	.....	54.5_{17}	24.7	24.8	33.6	32.0	230–110	gn. M. S.
XXXVIII	June 29	6:30 p.m.	25	54_{17}	25.0	25.3	29.7	30.4	55–26	dk. gy. S. Sh.
XXXIX	July 6	2:30 p.m.	25	(50.5_{23})	45.3	45.6	13.3	11.6	7–9	S.
XL	July 6	3:30 p.m.	10	$50_{(21)}$	45.3	.....	11.6	.....	7–9	S. R.
					32°		117°			
XLI–1*	July 12	8:50 a.m.	5	B	41.4	.....	14.2	.....	4–6	crs. S. brk. Sh.
XLI–2	July 12	9:00 a.m.	5	B	41.4	.....	14.2	.....	4–6	crs. S. brk. Sh.
XLI–3	July 12	9:15 a.m.	10	B	41.4	.....	14.2	.....	4–6	crs. S. brk. Sh.
XLI–4†	July 12	9:40 a.m.	2	B	41.4	.....	14.3	.....	4–6	crs. S. brk. Sh.
XLI–5	July 12	9:58 a.m.	2	B	41.4	.....	14.3	.....	4–6	crs. S. brk. Sh.
XLII	July 12	10:05 a.m.	5	B	41.2	41.1	14.2	14.3	5–13	sft. bk. M.
XLIII–1	July 13	7:35 a.m.	5	B	41.2	41.1	14.2	14.3	5–13	sft. bk. M.
XLIII–2	July 13	8:00 a.m.	5	B	41.4	41.3	14.2	14.3	9–15	sft. bk. M.
XLIII–3	July 13	9:40 a.m.	10	B	41.4	41.3	14.2	14.3	9–15	sft. bk. M.
XLIII–4	July 13	10:30 a.m.	2	B	41.4	.....	14.3	.....	9–15	sft. bk. M.
XLIV	July 13	4:00 p.m.	15	B	42.0	42.7	14.1	13.3	9–11	brk. Sh.
XLV	July 14	.....	.....	B	41.2	40.0	14.4	14.5	0	Shore collection
XLVI–1	July 15	7:50 a.m.	10	$(38_{.})$	39.9	40.2	11.1	10.9	9	S.
XLVI–2	July 15	8:20 a.m.	60	$(38_{.})$	40.2	39.2	10.9	9.8	9–11	S.
XLVI–3	July 15	9:30 a.m.	15	$(38_{.})$	40.2	.....	10.9	.....	9	crs. yl. S.
XLVI–4	July 15	10:35 a.m.	60	$(38_{.})$	.....	39.9	.....	10.9	9–11	S.
XLVII–1	July 16	8:10 a.m.	30	$(38_{.})$	38.3	39.3	12.1	10.9	18–15	S.
XLVII–2	July 16	9:00 a.m.	60	$(38_{7.5})$	39.3	36.7	10.9	12.1	15–19	hrd. S. P.
XLVII–3	July 16	10:20 a.m.	60	$(38_{7.5})$	36.7	39.3	12.1	10.9	18–20	hrd. S. P.
XLVIII–1‡	July 16	2:45 p.m.	10	B	41.1	40.0	13.9	13.8	24–15	S. brk. Sh.
XLVIII–2	July 16	3:10 p.m.	20	B	39.9	41.1	13.6	13.8	11–16	S. brk. Sh.
XLIX	July 16	4:00 p.m.	10	B	40.9	.....	14.1	.....	5	hrd. S. P.
L–1	July 17	8:30 a.m.	40	39_{7}	36.9	.....	14.7	.....	39–51	rky.
L–2	July 17	9:10 a.m.	60	$(39_{7.5})$	.....	37.5	.....	15.3	51–44	S. Sh. fne. M. R.
L–3	July 17	10:20 a.m.	20	39_{7}	37.5	37.2	15.3	14.7	44	rky.
LI–1	July 17	1:40 p.m.	60	B	41.7	42.4	14.3	13.3	11–22	crs. S. brk. Sh.
LI–2	July 17	1:40 p.m.	60	B	41.7	42.4	14.3	13.3	11–22	crs. S. brk. Sh.
LI–3	July 17	3:00 p.m.	30	B	42.4	42.9	13.7	13.0	11–16	M. S.
LII	July 17-18	.....	.....	B	41.2	.....	13.5	.....	0	M. S. Shore collection
LIII	July 18	10:00 a.m.	10	$(39_{.})$	39.3	.....	13.4	.....	4–7	crs. S. brk. Sh.
LIV	July 18	11:00 a.m.	20	$(39_{.})$	40.3	.....	14.0	.....	6–4	S.
LV–1	July 18	2:10 p.m.	50	$39_{6.5}$	36	32	14	15	42–46	sft. M. S.
LV–2	July 18	3:15 p.m.	25	$39_{6.5}$	32	36	14	14	46–41	sft. M. S. R.
LVI	July 18	4:15 p.m.	15	B	39.0	39.7	14.0	14.7	16–9	S.
LVII	July 19	7:55 a.m.	60	39.5_{5}	26.6	26.0	17.6	15.2	44–33	fne. S. M.
LVIII	July 19	9:30 a.m.	60	39_{5}	26.0	25.2	15.2	14.4	33–27	S. brk. Sh.
LIX	July 19	1:05 p.m.	30	$39_{.}$	.....	23.7	.....	13.0	28	fne. gy. S.
LX	July 19	3:05 p.m.	5	$39_{.}$	26.8	26.8	17.2	17.2	55	rky.
LXI	July 19	4:22 p.m.	30	$39_{.}$	.....	.....	.....	.....	47–44	crs. yl. S.
LXII	July 20	9:20 a.m.	50	$(39_{.})$	37	.....	15	.....	29–33	fne. gy. S.
LXIII	July 20	10:30 a.m.	2	$(39_{7.5})$	37.6	36.5	14.5	14.5	36	rky.

* Catches XLI–1 and 3 were combined.

† Catches XLI–4 and 5 were combined.

‡ Catches XLVIII–1 and 2 were combined.

TABLE 6.—DATA RELATIVE TO DREDGE HAULS—(*Continued*)

Part A—Dredge Hauls made during 1901

Haul number	Date 1901	Time of day	Duration in minutes	Section	Latitude N Begin	Latitude N End	Longitude W Begin	Longitude W End	Depth in meters	Character of bottom and remarks
					32°		117°			
LXIV	July 20	11:00 a.m.	30	$(39_{7.5})$	37.4	38.5	15.2	14.1	35–20	S.
LXV	July 20	2:45 p.m.	.....	.....	42.7	43.1	13.4	12.9	5–6	S.
LXVI	July 20	4:10 p.m.	20	B	42.6	43.0	13.4	12.9	13–16	S. brk. Sh.
LXVII	July 22	8:40 a.m.	60	(39_8)	38	41	16	17	35–57	gy. yl. S.
LXVIII	July 22	10:00 a.m.	55	$(39_{8.5})$	41	44	17	17	55–35	gn. M. S.
LXIX–1	July 22	11:20 a.m.	70	$(39_{8.5})$	43	39	17.5	16.5	59–53	gn. M. S.
LXIX–2	July 22	1:00 p.m.	.....	(39_8)	39	.....	16.5	.....	59–53	rky.
LXX–1	July 23	8:45 a.m.	25	(39_{10})	52.0	.....	17.0	.....	250–100	rky.
LXX–2	July 23	9:55 a.m.	10	(39_{10})	51.6	51.6	17.0	16.3	180–98	rky.
LXX–3	July 23	10:45 a.m.	20	(39_{10})	52	.....	17	.....	195–100	rky. fne. M.
LXX–4	July 23	1:50 p.m.	20	(39_{10})	52	.....	17	.....	220–92	R. M. Cobbles
LXX–5	July 23	2:15 p.m.	25	(39_{10})	52	.....	17	.....	215–99	M. R.
LXX–6	July 31	8:30 a.m.	12	(39_{10})	52	.....	17	.....	230–99	M. R. S.
LXX–7	July 31	9:15 a.m.	15	(39_{10})	52	.....	17	.....	230–100	R.
LXXI	July 23	11:30 a.m.	30	(39_{10})	52	.....	16	.....	102–28	sft. M.
LXXII–1	July 24	9:45 a.m.	60	$39.5_{7.5}$	35.6	37.8	18.5	17.0	84–88	sft. gn. M.
LXXII–2	July 24	11:25 a.m.	70	40_8	38	40	19	20	93–86	sft. gy. M.
LXXII–3	July 24	1:05 p.m.	60	40_8	40.0	41.2	20.0	18.9	92–82	dk. gn. M.
LXXII–4	July 24	2:40 p.m.	60	39.5_8	40.9	38.1	18.9	16.9	86–67	M.
LXXIII–1	July 25	10:10 a.m.	90	40.5_8	37.5	39.3	22.6	21.2	240–195	fne. gy. S.
LXXIII–2	July 25	12:01 p.m.	85	40_8	39.3	40.8	21.2	20.2	195–108	gn. M. S.
LXXIII–3	July 25	2:10 p.m.	65	40_8	42.0	42.5	22.1	20.6	195–104	dk. gn. M. fne. S.
LXXIV	July 26	9:30 a.m.	30	B	41.2	.....	9.5	.....	4–3	M. brk. Sh.
LXXV	July 26	10:20 a.m.	4	B	39.5	.....	7.5	.....	6–4	M.
LXXVI	July 26	2:00 p.m.	105	B	41.6	.....	14.1	.....	4–6	crs. yl. S. brk. Sh.
LXXVII	July 26	4:00 p.m.	15	B	40.0	.....	14.0	.....	5–6	hrd. S. R.
LXXVIII	July 26	.....	.....	B	42.3	.....	9.5	.....	.....	Collected from piles
LXXIX–1	July 27	9:25 a.m.	20	40_6	30.0	30.5	20.0	19.0	115–119	gn. M. brk. Sh.
LXXIX–2	July 27	10:45 a.m.	60	39.5_6	32.0	30.5	18.0	17.0	117–105	rky.
LXXIX–3	July 27	1:45 p.m.	75	39.5_6	30.5	31	17.0	19	104–250	rky.
LXXIX–4	July 27	3:25 p.m.	55	$40_{8.5}$	32.0	34.5	19.0	18.5	250–104	rky.
LXXX–1	July 29	9:10 a.m.	60	40_8	32.0	31.0	20.0	19.5	250	fne. gn. gy. M. S.
LXXX–2	July 29	11:20 a.m.	120	40_7	30.0	31.4	22.2	18.6	230–108	fne. M. S.
LXXX–3	July 29	2:55 p.m.	60	40.5_6	30.7	31.3	22.8	20.0	230–108	rky.
LXXXI–1	July 30	8:05 a.m.	30	39_7	37.5	37.0	15.2	15.5	30–46	S. R.
LXXXI–2	July 30	9:15 a.m.	30	$(39_{7.5})$	37.0	38.1	15.5	14.8	46–27	S. R.
LXXXI–3	July 30	9:50 a.m.	2	39_7	37.0	37.0	14.5	14.5	33	S. R.
LXXXI–4	July 30	10:00 a.m.	20	$(39_{7.5})$	37.0	38.0	14.5	13.4	33–18	S. R.
LXXXI–5	July 30	10:45 a.m.	15	$(39_{7.5})$	37.2	37.8	14.7	14.0	33–27	S. St.
					33°		118°			
LXXXII–1	Aug. 5	9:00 a.m.	40	52_{20}	41.4	41.7	18.3	19.1	49–55	fne. gy. S.
LXXXII–2	Aug. 5	10:00 a.m.	75	51.5_{20}	41.7	40.0	19.1	16.6	55–56	
LXXXIII	Aug. 5	.....	.....	51.5_{26}	40	39	18	17	110–240	S. brk. Sh.

EXPLANATION OF TABLE 6, PART B

This part includes all the field data relative to the dredge hauls and shore collections accessioned under Arabic numerals.

First column.—Numbers under which the dredgings were accessioned; they are for the most part in chronological order.

Second column.—Date.

Third column.—Time at which haul began entered to the nearest minute.

Fourth column.—Duration of haul entered to the nearest minute.

Fifth column.—Section; for explanation see page 46.

Sixth and seventh columns.—Latitude and longitude at time the haul began; for error see pages 18 and 45.

Eighth column.—Depth of bottom at beginning or at both beginning and end of haul entered to the nearest meter above 300 and to the nearest five below that depth.

Ninth column.—Character of bottom denoted by symbols adopted by the United States Coast and Geodetic Survey (see Appendix IV).

Table 6.—Data Relative to Dredge Hauls—(*Continued*)

Part B—Dredge Hauls made Subsequent to 1901

Haul number	Date	Time of day	Duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Character of bottom and remarks
	1904							
190	July 15	.....	.....	B	32° 41.9	117° 10.3	0	From piles of ferryslip
191	July 15	.....	.....	(39_{10})	32 51.0	117 16.5	0	R. Shore collection
192	July 16	.....	.....	B	32 40.0	117 14.2	0	R. Shore collection
194	July 16	.....	.....	B	32 40.5	117 13.5	0	Low tide collection
195	July 16	.....	.....	(38_8)	32 41.0	117 11.5	0	Low tide collection
204	July 19	.....	.....	B	32 41.7	117 11.5	0	M. Shore collection
252*	Aug. 20	.....	.....	B	32 41.5	117 14.2	6–9	S. M.
	1905							
889	June 21	.....	.....	(39.5_{10})	32 52.2	117 17.5	208	
890	June 21	.....	.....	(39.5_{10})	32 52.2	117 17.5	208	
891	June 21	.....	.....	(39.5_{10})	32 52.4	117 17.5	146	
895	June 22	.....	.....	(39_{10})	32 51.8	117 17.1	46	S.
899	June 22	.....	.....	40_{11}	32 55.3	117 19.5	197	
901	June 22	.....	.....	40_{11}	32 55.3	117 19.5	197	
905	June 23	.....	.....	(39_{10})	.....	.....	0	S. R. Shore collection about La Jolla
931	June 28	2:55 p.m.	.....	40_{11}	32 53.6	117 18.4	146	
956a	July 1	11:00 a.m.	.....	(39_{10})	32 52.2	117 16.8	155	
956b	July 1	11:30 a.m.	.....	(39_{10})	32 52.2	117 16.8	55–256	
956c	July 1	12:40 p.m.	.....	(39_{10})	32 52.2	117 16.8	155	
958	July 4	.....	.....	(39_{10})	.....	.....	0	S. R. Low tide collection about La Jolla
972	July 7	3:00 p.m.	.....	(39.5_{12})	32 54.8	117 17.5	230	
973	July 7	11:10 a.m.	.....	(39_{10})	32 52.4	117 17.3	146	
974	July 7	12:13 p.m.	.....	(39_{11})	32 52.7	117 17.0	155–185	
975	July 7	12:53 p.m.	.....	(39_{11})	32 52.7	117 17.0	155–185	

* This haul includes all specimens taken between Aug. 20 and Sept. 1 from the mud pumped up by a steam harbor dredge.

TABLE 6.—DATA RELATIVE TO DREDGE HAULS—(*Continued*)

Part B—Dredge Hauls made Subsequent to 1901

Haul number	Date	Time of day	Duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Character of bottom and remarks
	1905							
989	July 10	.....	.....	(39_{10})	.....	.....	0	S. R. Shore collection
990	July 10	1:00 p.m.	.....	$(39_{10.5})$	32° 52.2	117° 17.4	185	about La Jolla
991	July 10	2:05 p.m.	.....	$(39_{10.5})$	32 52.5	117 17.4	146	
998	July 11	11:40 a.m.	.....	$(40)_{10}$	32 52.3	117 17.7	200	
1009	July 12	.....	.....	(39_{11})	32 52.6	117 17.0	200	
1022	July 18	3:15 p.m.	30	$50.5_{9.5}$	32 47.5	118 12.5	730	gn. M. S.
1023	July 19	.....	.....	.....	.....	.....	0	Tide pool collection at San Clemente Isle.
1025	July 19	9:05 a.m.	28	53_9	32 46.8	118 23.1	110	S. Sh.
1026	July 19	11:30 a.m.	20	52_8	.....	.....	395	S. gn. M.
1027	July 19	3:55 p.m.	31	53_{11}	32 53.0	118 24.0	605	
1028	July 20	9:32 a.m.	18	$51_{11.5}$	32 57.5	118 16.9	930	gn M.
1033	July 20	7:00 p.m.	25	49_{11}	32 56.5	118 5.0	660	gn. M.
1037	July 21	1:30 p.m.	55	42_{11}	32 55.0	117 31.6	760	gn. M.
1038	July 21	5:10 p.m.	40	41_{11}	32 53.5	117 24.2	565	gn. M.
1044	July 27	10:30 a.m.	25	40_{11}	32 56.8	117 22.8	460	
1047	July 28	11:30 a.m.	.....	(39_{11})	32 54.8	117 17.3	185	
	1906							
1092	June 19	5:30 a.m.	.....	40_{11}	32 52.6	117 17.8	73	S. Sh.
1102	June 20	5:40 a.m.	.....	(39_{10})	32 51.6	117 16.8	64–27	S. M. brk. Sh.
1112	June 21	6:15 a.m.	30	(39_{10})	32 51.5	117 17.0	82	gn. M. fne. S.
1121	June 25	10:15 a.m.	35	(39_{11})	32 54.9	117 17.3	185	gn. M. fne. S.
1122	June 25	11:10 a.m.	40	(39_{11})	32 54.9	117 17.3	185	gn. M. fne. S.
1123	June 25	12:55 p.m.	40	40_{11}	32 54.6	117 18.3	292	gn. M.
1124	June 25	2:30 p.m.	35	40_{11}	32 55.1	117 18.5	292	gn. M.
1145	June 27	8:23 a.m.	17	(39_{10})	32 52.0	117 16.0	55	S. M.
1146	June 27	9:05 a.m.	15	(39_{10})	32 52.0	117 15.9	13	S.
1147	June 27	9:35 a.m.	5	(39_{10})	32 52.0	117 15.9	18	S.
1148	June 27	10:00 a.m.	10	(39_{10})	32 52.0	117 15.9	11	S.
1155	June 28	11:15 a.m.	30	$(40)_{10}$	32 52.4	117 19.0	128	gn. M.
1156	June 28	12:32 p.m.	28	40_{11}	32 52.8	117 19.8	230	gn. M.
1157	June 28	1:15 p.m.	35	40_{11}	32 53.0	117 20.5	290	gn. M.
1164	June 29	9:00 a.m.	20	(39_{11})	.....	.....	24–9	S.
1165	June 29	9:25 a.m.	30	(39_{11})	.....	.....	15–7	S.
1166	June 29	10:10 a.m.	10	(39_{11})	.....	.....	9–24	S.
1167	June 29	10:55 a.m.	30	(39_{11})	.....	.....	22–11	S.
1186	July 2	10:10 a.m.	75	$(40)_{10}$	32 50.3	117 21.4	110–185	gn. M.
1187	July 2	11:45 a.m.	40	41_{10}	32 50.1	117 22.7	185–230	gn. M.
	1906							
1188	July 2	12:40 p.m.	35	41_{10}	32 50.0	117 23.4	275–340	gn. M.
1189	July 2	1:25 p.m.	55	41_{10}	32 49.8	117 24.8	330–365	gn. M.
1196	July 3	9:30 a.m.	15	$(40)_{10}$	32 51.0	117 20.0	73	rky.
1197	July 3	10:20 a.m.	25	$(40)_{10}$	32 51.0	117 19.0	55–73	
1198	July 3	10:55 a.m.	20	$(40)_{10}$	32 50.9	117 18.0	73–46	
1199	July 3	11:20 a.m.	20	$(40)_{10}$	32 50.9	117 18.0	46–73	
1200	July 3	1:50 p.m.	35	(39_{10})	32 51.5	117 16.0	33	S.
1201	July 3	2:33 p.m.	17	(39_{10})	32 51.5	117 16.0	18–46	S.
1202	July 3	3:00 p.m.	15	(39_{10})	32 51.5	117 16.4	146	rky.
1203	July 3	3:25 p.m.	.....	(39_{10})	32 51.5	117 16.3	27–46	S.
1238	July 9	.....	.....	B	32 41.5	117 13.5	0	S. Shore collection
1239	July 10	9:20 a.m.	20	B	32 41.2	117 14.0	18	S.
1279	July 14	9:05 a.m.	38	(39_{11})	32 54.4	117 15.8	7–10	S.
1280	July 14	10:15 a.m.	43	(39_{11})	32 54.4	117 15.8	10–15	S.
1287	July 16	10:10 a.m.	20	$(40)_{10}$	32 50.0	117 18.3	55–73	R.
1288	July 16	10:45 a.m.	15	$(40)_{10}$	32 49.7	117 18.6	73–92	rky.
1289	July 16	12:20 p.m.	30	$(40)_{10}$	32 49.0	117 19.4	110–128	C. S.
1290	July 16	1:00 p.m.	30	$(40)_{10}$	32 48.7	117 19.8	146–185	C. S.
1291	July 16	1:40 p.m.	25	$(40)_{10}$	32 48.4	117 20.1	185–275	brk. S.
1298	July 17	9:50 a.m.	35	(39_{11})	.....	.....	9	S.
1299	July 17	10:50 a.m.	15	(39_{11})	.....	.....	10	S.
1330	July 20	9:30 a.m.	25	$(40)_{10}$	32 51.2	117 18.8	80	M. R.
1331	July 20	10:15 a.m.	30	$(40)_{10}$	32 50.8	117 20.8	92–130	
1332	July 20	11:00 a.m.	45	$(40)_{10}$	32 51.2	117 21.0	145–185	
1333	July 20	11:50 a.m.	35	$(40)_{10}$	32 51.2	117 21.0	185–275	

Table 6.—Data Relative to Dredge Hauls—(*Concluded*)

Part B—Dredge Hauls made Subsequent to 1901

Haul number	Date	Time of day	Duration of haul	Section	Position N lat.	Position W long.	Depth in meters	Character of bottom and remarks
	1906							
1334	July 20	12:40 p.m.	55	$(40)_{10.5}$	32° 52.5	117° 18.8	275–230	
1335	July 20	1:40 p.m.	40	$(40)_{10.5}$	32 52.5	117 18.4	220–155	
1360	July 19	.....	.....	(39_{10})	32 51.5	117 15.5	0	S.) Shore collection
1361	July 23	.....	.....	(39_{10})	32 48.7	117 16.5	0	R.) about La Jolla
1365	July 24	9:50 a.m.	50	40_9	.....	.....	92–128	
1366	July 24	10:45 a.m.	40	40_9	.....	.....	128–145	
1367	July 24	11:25 a.m.	40	40_9	.....	.....	165–185	
1368	July 24	12:10 p.m.	55	40_9	.....	.....	185–238	
1369	July 24	1:10 p.m.	50	40_9	.....	.....	238–185	
1370	July 24	2:05 p.m.	25	40_9	.....	.....	165–128	rky.
	1908							
1474	June 19	3:15 p.m.	45	40_{11}	32 53.7	117 19.1	93–185	fne. S.
1475	June 19	3:15 p.m.	45	40_{11}	32 53.7	117 19.1	93–185	fne. S.
1486	June 24	1:00 p.m.	110	42_{14}	33 9.7	117 35.8	735	gn. M.
1487	June 24	1:00 p.m.	110	42_{14}	33 9.7	117 35.8	735	gn. M.
1497	June 25	2:10 p.m.	40	$(40)_{10}$	32 50.7	117 21.5	93–185	bk. S.
1498	June 25	3:00 p.m.	30	$(40)_{10}$	32 51.4	117 21.5	185–275	bk. S.
1526	July 2	7:45 a.m.	105	50_{13}	33 6.7	118 9.4	1140	gn. br. M.
1531	July 7	7:30 a.m.	70	52_9	32 46.5	118 20.5	505	bk. M.
1534	July 7	11:30 a.m.	60	52_9	32 45.7	118 19.5	800	gy. S.
1539	July 9	10:30 a.m.	30	55_{12}	33 0.5	118 33.3	147–550	rky.
1540	July 9	12:30 p.m.	39	55_{12}	32 59.0	118 31.4	550	gy. M.
1541	July 9	2:05 p.m.	95	54_{12}	33 0.2	118 31.3	249–920	gy. M.
1551	July 17	8:30 a.m.	30	61_5	32 23.2	119 5.4	88	crs. S.
1552	July 17	9:15 a.m.	42	61_5	32 23.5	119 5.8	92	crs. S.
1554	July 17	10:25 a.m.	30	61_5	32 23.7	119 6.0	95	crs. S.
1555	July 17	11:40 a.m.	96	61_5	32 23.7	119 6.0	92	crs. S.
1556	July 17	1:32 p.m.	37	61_5	32 23.7	119 6.0	92	crs. S. bk. M.
1561	July 18	9:28 a.m.	11	61_5	32 24.2	119 6.2	19–29	rky.
1630	Sept. 1	6:50 a.m.	25	$15^{48.5}$	27 57.5	115 13.2	33	brk. Sh.
1631	Sept. 1	8:40 a.m.	20	14^{49}	27 54.2	115 8.0	33	brk. Sh.
1632	Sept. 1	10:25 a.m.	35	13^{48}	28 2.1	115 6.0	73	gn. M.
1633	Sept. 1	12:15 p.m.	45	13^{45}	28 13.3	115 5.2	73	gn. M.
	1909							
1663	June 18	1:35 p.m.	15	B	32 40.7	117 8.8	2–3	gn. M.
1664	June 18	2:05 p.m.	25	B	32 39.2	117 7.8	2–3	S.
1665	June 18	3:30 p.m.	30	B	32 37.8	117 8.2	2–3	S.
1669	June 19	10:36 a.m.	24	B	32 42.0	117 14.2	3	
1670	June 19	11:05 a.m.	40	B	32 43.1	117 13.0	3	
1780	July 1	1:15 p.m.	65	53_{11}	32 54.0	118 26.0	185	rky.
1781	July 1	2:55 p.m.	15	52_{10}	32 50.2	118 22.0	110	
1782	July 1	3:34 p.m.	11	52_{10}	32 48.1	118 19.7	120	
	1912							
3181	Feb. 10	2:40 p.m.	20	39_6	32 28.5	117 15.3	55	gn. M.
3182	Feb. 11	5:10 a.m.	20	$(38)_6$	32 28.0	117 11.2	31	gn. M. S.

APPENDIX I

Dimensions and Measurements of Nets used in Making our Collections

Net symbol	Size of mesh	Meshes per sq. cm.	Kind of netting	Diameter in cm.		Slant length in cm.		
				Orifice	Bucket	Head-piece	Net-ting	Foot-piece
000	000	75	bolting silk	97.5	17.0	17.2	180.5	8.0
000c	000	31	stramine	97.5	17.0	22.0	304.8	20.3
0	0	224	bolting silk	.....	.....	.....	.....	.....
8	8	1094	bolting silk	36.0	4.5	29.0	96.5	5.0
9	9	1369	bolting silk	36.0	4.5	29.0	96.5	5.0
10	10	1742	bolting silk	36.0	4.5	29.0	96.5	5.0
12	12	2384	bolting silk	36.0	4.5	29.0	96.5	5.0
20	20	4640	bolting silk	36.0	4.5	29.0	96.5	5.0
L.N.1	1	358	bolting silk	109.5	13.5	51.0	210.0	13.0
S.N.1	1	358	bolting silk	45.0	8.0	.....	.....	.....
N.0	0	224	bolting silk	62.5	8.0	44.7	120.5	10.0
N.000	000	75	bolting silk	62.5	8.0	44.7	120.5	10.0
K.000	000	75	bolting silk	37.0	8.0	15.2	96.5	10.2
K.20	20	4640	bolting silk	37.0	8.0	15.2	96.5	10.2
S.20	20	4640	bolting silk	62.5	8.0	51.0	.....	13.0

The first eight nets are ordinary surface tow-nets (see p. 9); the next four, Nansen closing nets (see p. 10); the next two, Kofoid closing nets (see p. 11), and the last a special net designed for making open vertical hauls. In order to increase the filtering capacity the netting was cut very full and gathered, its original diameter exceeding by two or three times that of the orifice. The net was used but a short time during July, 1912, when it was lost.

APPENDIX II

Length in Meters of Hauls Made during July, 1912, with the Kofoid Closing Net

In the following list the duration of each haul is entered to the nearest minute and each length of haul to the nearest meter, while the haul numbers are those entered in table 5. Each length of haul was computed from the duration of the haul and the velocity, relative to the water, with which the net moved. Since the velocity was measured by an Ekman current meter suspended below the net, as

described on page 13, each length is proportional to the volume of water which would have passed through the orifice of the net if unobstructed.

Haul number	Duration of haul	Length of haul	Depth in meters	Haul number	Duration of haul	Length of haul	Depth in meters
3352	5	164	5	3396	5	63	9
3354	5	48	9	3398	5	121	18
3356	5	157	18	3400	5	116	27
3359	5	90	46	3401	5	144	37
3360	5	108	55	3402	5	140	46
3361	5	146	92	3404	5	126	55
3362	5	174	92	3405	5	126	73
3364	5	122	137	3406	5	126	92
3366	5	128	183	3407	5	126	92
3367	5	117	275	3409	5	130	46
3368	5	137	365	3410	5	141	37
3369	5	194	27	3411	5	128	185
3373	5	116	73	3413	5	106	187
3375	5	174	275	3416	6	158	550
3377	5	147	367	3419	5	156	18
3378	5	158	5	3420	5	140	275
3379	5	157	9	3434	5	108	5
3381	5	186	18	3438	6	161	27
3382	5	211	27	3443	5	164	37
3383	5	220	37	3446	5	179	46
3386	5	204	55	3447	5	154	55
3387	5	224	73	3449	5	193	73
3388	5	131	183	3450	5	167	92
3391	5	262	275	3454	5	113	275
3392	5	192	137	3455	5	200	46

Haul 3405 was repeated because the net was torn to pieces on the first trial. Since both trials consumed the same amount of time and the current meter registered during both, an idea of its accuracy may be obtained; the length relative to the first trial was 127 and that relative to the second 126 meters.

APPENDIX III

List of Hauls and Water Samples whose Distances from the Bottom are known to be within 15 per cent of the Depth

Haul numbers are those entered in table 5, sounding numbers those entered in table 4, and water-sample numbers those entered in table 1. Owing to errors due to drift, only those soundings and collections that were made at approximately the same time are listed.

Haul number	Sounding number	Haul number	Sounding number	Water sample number	Sounding number	Water sample number	Sounding number
920g	1	1905	225	78	72	2724	319
921g	1	1914	228	99	84	2745	320
925	2	1924	236–39	102	85	2763	321
935	4	1957	245	144	125	2777	322
938	5	1973	247	230	140	2788	323
939	6	2048	250	549	213	2799	324
950	7	2122	251	981	216	2804	325
953	8	2199	255	1002	218	2808	326
979	10	2567	285	1063	219	2823	327
1134–36	12	2570	287	1213	225	2835	328
1229–51	15	3308	335	1227	226	2845	329
1303–05	17	3332	362	1276	228	2866	331
1315–17	18	3333	363	1287	234	2873	332
1339–41	20	3334	364	1295	236–39	3223	362
1351–53	21	3335	365	1392	245	3226	363
1441	63–64	3336	368	2138	284	3228	364
1463–64	72	3337	369	2151	287	3254	371
1482	84	3338	370	2152	288	3256	372
1484	85	3339	371	2385	292	3258	373
1516–21	125	3341	372	2392	293	3260	374
1608	213	3343	373	2466	303	3609	376
1648	216	3345	374	2487	306		
1705	218	3550	376	2494	307		
1773	219			2703	318		

Water-sample 2152 consisted of clear water taken within three-tenths of a meter from the bottom, the lower half of a sixteen-pound window-weight suspended directly below the Ekman bottle having been covered with mud.

APPENDIX IV

Abbreviations for Character of the Bottom adopted by the United States Coast and Geodetic Survey

M. ..... mud	bk. ..... black	hrd. ..... hard
S. ..... sand	wh. ..... white	sft. ..... soft
Sh. ..... shells	yl. ..... yellow	fne. ..... fine
G. ..... gravel	gy. ..... gray	crs. ..... coarse
P. ..... pebbles	bu. ..... blue	brk. ..... broken
Sp. ..... specks	dk. ..... dark	stk. ..... sticky
C. ..... clay	gn. ..... green	rky. ..... rocky
St. ..... stones	rd. ..... red	sm. ..... small
R. ..... rocks	br. ..... brown	lg. ..... large
Co. ..... coral		

APPENDIX V

Tables for Converting Meters into Fathoms and Fathoms into Meters

Meters to Fathoms

1 meter = 0.546817 fathoms (log. 9.7378416–10)

Meters	0	1	2	3	4	5	6	7	8	9
					Fathoms					
0	0.0	0.5	1.1	1.6	2.2	2.7	3.3	3.8	4.4	4.9
10	5.5	6.0	6.6	7.1	7.7	8.2	8.7	9.3	9.8	10.4
20	10.9	11.5	12.0	12.6	13.1	13.7	14.2	14.8	15.3	15.9
30	16.4	17.0	17.5	18.0	18.6	19.1	19.7	20.2	20.8	21.3
40	21.9	22.4	23.0	23.5	24.1	24.6	25.2	25.7	26.2	26.8
50	27.3	27.9	28.4	29.0	29.5	30.1	30.6	31.2	31.7	32.3
60	32.8	33.4	33.9	34.5	35.0	35.5	36.1	36.6	37.2	37.7
70	38.3	38.8	39.4	39.9	40.5	41.0	41.6	42.1	42.6	43.2
80	43.8	44.3	44.8	45.4	45.9	46.5	47.0	47.6	48.1	48.7
90	49.2	49.8	50.3	50.8	51.4	52.0	52.5	53.0	53.6	54.1

Meters	0	100	200	300	400	500	600	700	800	900
					Fathoms					
0	0	55	109	164	219	273	328	383	437	492
1,000	547	601	656	711	766	820	875	930	984	1,039
2,000	1,094	1,148	1,203	1,258	1,312	1,367	1,422	1,476	1,531	1,586
3,000	1,640	1,695	1,750	1,804	1,859	1,914	1,969	2,023	2,078	2,133
4,000	2,187	2,242	2,297	2,351	2,406	2,461	2,515	2,570	2,625	2,679
5,000	2,734	2,789	2,843	2,898	2,953	3,007	3,062	3,117	3,172	3,226
6,000	3,281	3,336	3,390	3,445	3,500	3,554	3,609	3,664	3,718	3,773
7,000	3,828	3,882	3,937	3,992	4,046	4,101	4,156	4,210	4,265	4,320
8,000	4,375	4,429	4,484	4,539	4,593	4,648	4,703	4,757	4,812	4,867
9,000	4,921	4,976	5,031	5,085	5,140	5,195	5,249	5,304	5,359	5,413

FATHOMS TO METERS

1 fathom = 1.828768 meters (log. 0.2621584)

Fathoms	0	1	2	3	4	5	6	7	8	9
					Meters					
0	0.0	1.8	3.7	5.5	7.3	9.1	11.0	12.8	14.6	16.5
10	18.3	20.1	22.0	23.8	25.6	27.4	29.3	31.1	32.9	34.8
20	36.6	38.4	40.2	42.0	43.9	45.7	47.6	49.4	51.2	53.0
30	54.9	56.7	58.5	60.4	62.2	64.0	65.8	67.7	69.5	71.3
40	73.2	75.0	76.8	78.6	80.5	82.3	84.1	85.9	87.8	89.6
50	91.4	93.3	95.1	96.9	98.8	100.6	102.4	104.2	106.1	107.9
60	109.7	111.5	113.4	115.2	117.0	118.9	120.7	122.5	124.4	126.2
70	128.0	129.8	131.7	133.5	135.3	137.2	139.0	140.8	142.6	144.5
80	146.3	148.1	150.0	151.8	153.6	155.5	157.3	159.1	160.9	162.8
90	164.6	166.4	168.2	170.1	171.9	173.7	175.6	177.4	179.2	181.0
Fathoms	0	100	200	300	400	500	600	700	800	900
					Meters					
0	0	183	366	549	732	914	1,097	1,280	1,463	1,646
1,000	1,829	2,012	2,195	2,377	2,560	2,743	2,926	3,109	3,292	3,475
2,000	3,658	3,840	4,023	4,206	4,389	4,572	4,755	4,938	5,121	5,303
3,000	5,486	5,669	5,852	6,035	6,218	6,401	6,584	6,766	6,949	7,132
4,000	7,315	7,498	7,681	7,864	8,047	8,229	8,412	8,595	8,778	8,961
5,000	9,144	9,327	9,510	9,692	9,875	10,058	10,241	10,424	10,607	10,790

APPENDIX VI

TABLE GIVING THE LENGTH IN METERS OF ONE MINUTE OF LONGITUDE FOR EACH DEGREE OF LATITUDE FROM THE EQUATOR TO 60°

Column 1—Degrees of latitude.

Column 2—Length in meters of one minute of longitude.

(1)	(2)	(1)	(2)	(1)	(2)
0	1855.1	26	1668.4	44	1336.6
5	1848.1	27	1654.0	45	1314.0
10	1827.1	28	1639.2	46	1290.9
11	1821.2	29	1623.8	47	1267.4
12	1814.8	30	1607.9	48	1243.6
13	1807.9	31	1591.5	49	1219.4
14	1800.3	32	1575.5	50	1194.8
15	1792.3	33	1557.4	51	1169.8
16	1783.7	34	1539.6	52	1144.5
17	1774.6	35	1521.3	53	1118.8
18	1764.9	36	1502.5	54	1092.8
19	1754.7	37	1483.3	55	1066.4
20	1743.9	38	1463.7	56	1039.7
21	1732.6	39	1443.6	57	1012.8
22	1720.8	40	1423.0	58	985.4
23	1708.5	41	1402.1	59	957.8
24	1695.6	42	1380.7	60	929.9
25	1682.3	43	1358.8	61	901.7

While one minute of latitude is approximately equal to a nautical mile, owing to the spheroidal shape of the earth, it varies slightly with the latitude:

At the equator it is 1842.8 meters
At 30° it is 1847.5 meters
At 60° it is 1856.9 meters
At the pole it is 1861.7 meters.

This variation in the length of one minute of latitude has been responsible for a lack of precision in defining a nautical mile. In order to establish uniformity it is now defined as 1853.248 meters, which is the length of one minute of a great circle of a sphere having the same superficial area as the earth.

This definition is adopted by the United States Coast and Geodetic Survey, and the value above given was computed from Clarke's values for the equatorial and polar radii, 6,378,206 and 6,356,584 meters.

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(1913-1915)

COMPILED AND ARRANGED UNDER THE SUPERVISION OF
W. E. RITTER

BY
ELLIS L. MICHAEL
Zoologist and Administrative Assistant

GEORGE F. McEWEN
Hydrographer

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INTRODUCTION

Experience gained through the marine explorations of the Scripps Institution demonstrates that variations in hydrographic as well as in many strictly biological conditions decidedly influence the vertical and horizontal movements of marine organisms, their abundance at any particular time and place, and many aspects of their life-histories and relations to one another. In fact, such hydro-biological relations are too complex, by far, to be discovered without numerous and detailed hydrographic observations corresponding in time and place to the biological ones. Not only is this true, but the variability in temperature and salinity, not to mention that of many other elements, is so great and its causes so complex as to demand much more continuous investigation than has been thus far possible. With these considerations in view, the Scripps Institution has temporarily discontinued its systematic plankton explorations, and, instead, is devoting time and energy to devising methods and equipment more suitable for conducting the more intensive researches required. It seems probable, therefore, that the next series of investigations will differ in many important respects from those already made. For this reason, together with the fact that a summary of all the hydrographic results is ready for the press, it is desirable to bring the publication of our crude data to date.

The present paper, therefore, includes the field data relative to all hydrographic and biological collections made since 1912. Since that time, no soundings, gas analyses, or current-meter observations have been made, and the hydrographic data relate entirely to temperatures and salinities. Similarly, dredging and trawling have been temporarily discontinued, except for museum and supply purposes; hence, the biological data relate only to plankton collections.

The apparatus, methods of collecting, methods of laboratory measurement, and methods of detecting errors employed during this period were essentially the same as those formerly (1915) described. A new serial closing apparatus has been added to the collecting equipment, and attachments have been made to the Kofoid closing water bottle; these additions are, therefore, briefly described. Furthermore, the criteria used for rejecting doubtful hydrographic observations were not treated fully enough in our former report (1915, pp. 21, 26) to avoid the incorrect implication that certain observations may have been omitted through oversight. Accordingly, these criteria are rediscussed under the proper heading.

A. COLLECTING APPARATUS AND EXAMINATION OF DATA FOR ERRORS

1. NEW APPARATUS

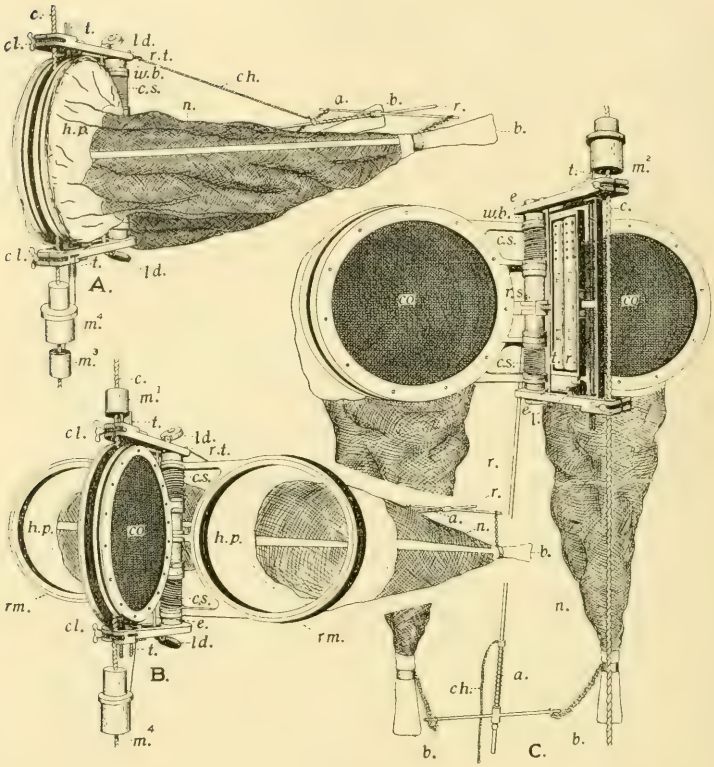
a. Serial closing apparatus.—The first step toward more intensive and continuous investigations consisted in devising an apparatus combining the essential advantages of the Kofoid closing net (Kofoid, 1911) and Ekman reversing water bottle (Ekman, 1905). Thanks to the mechanical ingenuity of our engineer, Mr. James Ross, two such pieces of apparatus have been constructed (text-figs. A, B, and C). They are not only adapted to simultaneous operation on the same cable, but have the additional advantage that two "equivalent" horizontal closing nets form an essential part of each. The two nets lie about six inches apart on opposite sides of the cable (text-figs. B and C), and, since they are operated simultaneously, duplicate hauls are made at each depth—one net thus acting as a check against the other. In connection with each pair of nets, a rack (*t.r.*) for holding two reversing thermometers and a small bottle (*w.b.*) for securing water samples are provided, which are operated upon closure of the nets. Each serial closing apparatus, therefore, consists essentially of two "equivalent" closing nets, a thermometer rack, and a water-sample bottle. The two already constructed weigh approximately fifty pounds apiece, but it is proposed that the next ones shall be made materially lighter. This can be accomplished by pressing out the metal parts instead of casting and machining them.

After each apparatus is clamped onto the cable and lowered to the desired depth, a messenger is dropped which opens the first pair of nets and releases a similar messenger which opens the second pair, etc. After the desired length of time, another messenger is dropped which closes the first pair of nets, reverses the thermometers, secures the water sample, and releases a similar messenger which operates the second apparatus in the same way, and so on for the whole series.

Important advantages of this apparatus are:

1. Duplicate closing-net hauls and corresponding temperatures and water samples obtained simultaneously at each of a series of depths.

2. Reversal of the thermometer rack closes the water bottle, which makes it mechanically impossible for the thermometer to register at



Abbreviations

a.—accumulator spring.	*ld.*—water-bottle lid.
b.—net-bucket.	m^1. and m^3.—opening messengers.
c.—cable.	m^2. and m^4.—closing messengers.
ch.—supporting chain.	*n.*—netting.
cl.—clamp for attaching apparatus.	*r.*—supporting rod.
co.—closing cover.	*rm.*—net rim (37 cm. diameter).
c.s.—coiled spring.	*r.s.*—rack spring.
e.—excentric rod.	*r.t.*—rod trip.
h.p.—headpiece of net (impervious).	*t.*—messenger trips.
l.—latch for locking rack (*t.r.*).	*t.r.*—thermometer rack.
w.b.—water bottle.	

Figs. A–C. Operation of Serial Closing Apparatus

Fig. A. Nets closed, ready for descent. Note especially the following: the clamps (*cl.*) by which the apparatus is attached to the cable (*c*); rod trip (*r.t.*) which, upon closure of water-bottle lids (*ld.*), releases the chain (*ch.*) supporting terminal end of rod (*r.*); tension on nets due to accumulator spring (*a*), which insures proper adjustment of *T* on supporting rod *r.*; net buckets (*b*), consisting of stork sheeting which has proved more satisfactory than bronze; messengers (m^3 and m^4) suspended from lower ends of trips (*t*) in readiness for opening and closing next lower pair of nets.

Fig. B. After descent of first messenger, m^4.; nets open, ready for towing. Note especially the following: position of net rims (*rm*), which have been turned by the coiled springs (*c.s.*) at right angles to the closing covers (*co.*), the latter remaining in same position as in figure A; closing covers (*co.*) consist of bronze rims to which copper screening of finer mesh than netting is attached (this is readily replaced by thin bronze plates when small-meshed nets are used); water bottle (*w.b.*) also serves as axis about which net rims (*rm.*) have revolved; messenger m^3., shown in figure A, has been released.

Fig. C. After descent of second messenger, m^2.; nets closed, water bottle (*w.b.*) closed, thermometer rack (*t.r.*) reversed, and supporting rod (*r.*) released, ready for hoisting. Note especially the following: *perspective at right angles* to that of figures A and B; excentric rods *e.* (shown also in figure B), by which water-bottle lids (*ld.*) were closed when thermometer rack (*t.r.*) was reversed by the rack spring (*r.s.*) and locked by the latch (*l.*), all of which is possible only after both closing covers (*co.*) have revolved against the net rims (*rm.*); messenger m^4., shown in figures A and B, has been released.

one depth and the bottle to close at another, *regardless of the inclination of the cable.*

3. It is mechanically impossible for the thermometers to reverse or the water bottle to close unless both nets are closed; thus, a valuable means is at hand for determining the approximate depth of closure in case it differs from that indicated by the amount of cable out.

4. The heavy weight suspended from the end of the cable may remain submerged when attaching and removing the apparatus, thus permitting collecting in rougher seas than would otherwise be possible.

5. The rod (*r.*) to which the net buckets (*b.*) are attached is so supported from the frame that when the nets are closed it is released and hangs below the frame (compare figs. A and C), while the apparatus is being hoisted, thus preventing undue strain upon the netting.

The only disadvantages so far suggested are three:

1. The dynamical pressure of water on more than two of the duplicate nets of each apparatus may so deflect the cable as to prevent the messengers from properly opening or closing the nets, unless a weight of at least fifty pounds is suspended from the end of the cable for each apparatus attached.

2. Even under the most favorable conditions of the sea, it is difficult and cumbersome to attach a fifty-pound apparatus to and remove it from the cable.

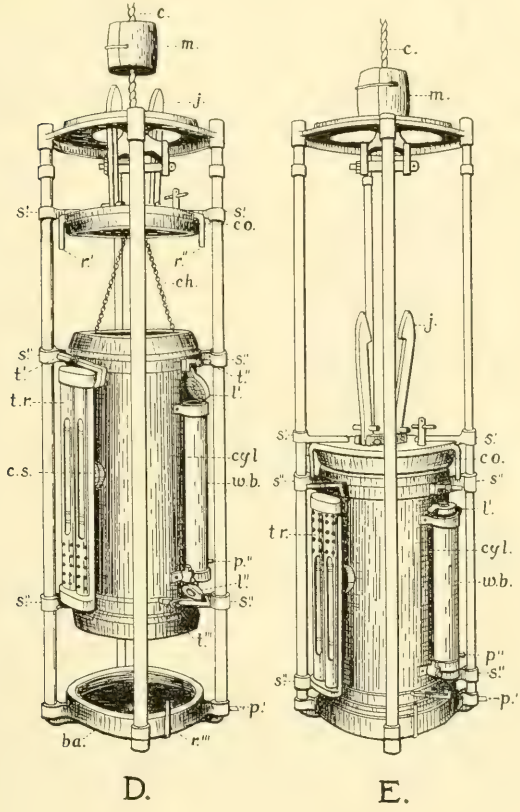
3. The covers (*co.*) which project in front of the orifices of the nets when open (fig. B), may modify the pressure-distribution of inflowing water so as to reduce significantly the rate of filtration.

How serious these disadvantages are remains to be determined. As stated on page 209, the second can be largely overcome by pressing out instead of casting the metal parts of the apparatus. Moreover, the preliminary collections made during May, 1915 (water samples 4918–5019, table 1; hauls 4062L–4205R, table 3) were much more satisfactory than we had reason to anticipate, because the cable then in use did not permit attaching as heavy a weight as seemed necessary. In spite of this, only eight cases were imperfect out of seventy-two operations, and these were due to insufficient tension on the closing trips. Furthermore, in the twenty-eight trials made on the last day, May 16, only one case of imperfect operation was discovered. On the whole, these results are very encouraging, but as further experience will probably suggest certain desirable modifications of the apparatus, a detailed description is not given.[1]

b. Attachments to the Kofoid water bottle.—To meet the requirements of a microplankton trip made during September, 1913, two mechanically independent attachments were added to the Kofoid water bottle (Kofoid, 1905) in order to permit the use of reversing thermometers, and to obtain an additional sample of water for salinity determination (text-figs. D and E). The temperature *in situ* is always given more accurately by reversing thermometers than by estimates based on the temperature of any sample inclosed in a non-insulated water bottle, and, as pointed out formerly (1915, p. 14), it has been impossible to make any such estimate for depths exceeding 350 meters. Again, in order to avoid withdrawing any of the organisms contained in the Kofoid bottle itself, the attachment for obtaining an additional water sample was added.

Frequent testing before and during actual collecting gave no evidence of defective operation. But the nature and degree of correlations between temperature and depth, salinity and depth, and temperature and salinity demonstrated that in fully ninety per cent of the 176 subsurface hauls made, the Kofoid bottle closed at some unknown depth significantly less than that indicated by the amount of cable out. Indeed, it seems probable that the remaining nineteen

[1] During the summer of 1916 about two hundred trials of this apparatus were made from the U. S. S. "Albatross." The very satisfactory results of this severe test proved the apparatus to be fully as reliable and durable as the Ekman water bottle.



Figs. D and E. Kofoid closing water bottle, showing thermometer rack and small water-sample bottle attached. *D.* Apparatus set for tripping by messenger. *E.* After closure of both bottles and reversal of thermometer rack. *Operation:* messenger (*m.*) descends cable (*c.*) and spreads jaws of clutch (*j.*), thus releasing cover (*co.*) and cylinder (*cyl.*) supported from it by a brass chain (*ch.*) which, dropping upon base (*ba.*), closes bottle. Alignment of cover and cylinder with base maintained by guiding sleeves (*s'* and *s''*). In closing, projecting rods (*r'*, *r''*, and *r'''*) strike corresponding trips (*t'*, *t''*, and *t'''*), which releases thermometer rack (*t.r.*), allowing coiled spring (*c.s.*) to reverse it, and the two lids (*l'* and *l''*) of the water-sample bottle (*w.b.*) to snap shut. Water is withdrawn from large and small bottles by removing plugs (*p'* and *p''*).

hauls were also contaminated, and that the corresponding temperatures and salinities were erroneous.

The precise reason for such repeated failure is unknown. It is true that the guiding sleeves (text-figs. D and E, *s'*) of the cover of the Kofoid bottle had become worn during years of previous use, and it is possible that the trouble was largely caused by the undue "play" of these sleeves combined with a possible inequality in tension of the thermometer and water-bottle trip-springs, and the usual inclination of the cable. It does not seem likely that the trouble was entirely due to the worn sleeves, since the bottle rarely failed to close properly prior to the addition of the attachments.

However, whatever the cause of defective operation may have been, the relations observed between the temperatures and corresponding salinities could not have arisen had the apparatus operated properly. On the whole, the hydrographic results can be accounted for only on the assumption that the depths at which the thermometers reversed, those at which the water-sample bottle closed, and those at which the Kofoid bottle closed differed materially and in an erratic way from each other and from the depths indicated by the amount of cable out. In fact, the depths indicated by temperatures and those indicated by the corresponding salinities proved to be so discordant as to preclude estimating, even roughly, the correct depth in any one case. For this reason, while all the subsurface hauls, because of their biological value, are entered in table 3, the corresponding hydrographic data are not tabulated.

2. ERRORS IN TEMPERATURE, SALINITY, AND DEPTH

All hydrographic observations are subject to several important sources of error. Some errors are inherent in the instrument used, and some are due to occasional mistakes, but the most difficult to detect are consequent upon the impossibility of constructing any piece of oceanographic apparatus that will not occasionally operate defectively. The causes of defective operation are exceedingly numerous, and, as stated formerly (1915, p. 21): "we doubt if anyone who has not been in actual charge of such work could anticipate the extent to which trouble is nearly always encountered." Even though all practicable precautions are taken, important errors unexpectedly arise, making it necessary to examine critically each series of observations in order to detect the erroneous ones and to reject those that may be misleading.

a. Reasons for rejecting temperatures taken prior to June, 1908.—During the preliminary explorations made between August, 1901, and June, 1908, about seventy-five surface temperatures were taken with ordinary chemical thermometers. Through oversight, their readings were recorded without making the necessary calibration correction, and, unfortunately, the thermometers were either lost or broken before August, 1908, when it was discovered that the recorded temperatures were subject to calibration errors. At this time, calibration of the thermometer that had been used during the two preceding months revealed an error ranging from 0°9 to 1°5 C, thus indicating that all seventy-five temperature observations were subject to calibration errors approximating two degrees Centigrade.

Even so, the records might have been of some biological value were it not for serious discrepancies between the positions of the temperature observations and those of the corresponding biological collections. The magnitudes of these discrepancies, for the most part, are unknown, but the records indicate that they must have frequently exceeded five miles. Since differences of two degrees have often been observed within a distance of two miles (McEwen, 1916), it follows that, for biological investigations, these preliminary temperature records are subject to an erratic error whose maximum approximates the observed annual range of seven degrees. Needless to say, such misleading temperatures are worse than none, and accordingly were not published in our former (1915) report.

b. Methods of detecting and rejecting doubtful subsurface observations.—In addition to mistakes which are not entirely avoidable, there are two sources of troublesome error affecting the measurement of temperature, and two affecting the measurement of salinity. Even the best reversing thermometers occasionally register incorrectly because the mercury column does not always break at the constriction. Likewise, the best containers may occasionally permit sufficient evaporation to increase the salinity materially if the water samples are not tested soon after being collected. While such errors are usually large enough to be revealed as soon as the measurements are made, they may be so small as to require for their detection special examination of all temperatures and salinities of the corresponding series. Finally, the collecting apparatus is designed to operate on a vertical cable, and, in case of undue inclination of the latter, the thermometers may either not reverse at all or may register at some higher level; similarly, the water bottle may either fail to close entirely or may close at a

higher level. Moreover, even when the cable is vertical and careful testing indicates that the apparatus is working properly, the thermometers occasionally reverse and the water bottle occasionally closes at a higher level.

On those few occasions when such an error in depth is immediately indicated by the temperature reading, the observation is, of course, repeated. In the majority of cases, however, a depth error made during any particular cruise can be discovered only after all the observations have been critically examined. Since the apparatus employed is designed to insure the simultaneous reversal of thermometers and closure of the water bottle, determination of the source and magnitude of temperature errors requires consideration of the corresponding salinities and densities *in situ;* similarly, determination of the source and magnitude of salinity errors requires consideration of the corresponding temperatures.

As indicated on page 212, correlation tables are drawn up between temperature and depth, salinity and depth, and temperature and salinity, and, if necessary, the results are compared with previous data obtained under similar conditions. These tables, together with the fact that the density *in situ* must increase with an increase in depth (Michael and McEwen, 1915, p. 25), and that temperature and salinity curves must have certain well defined limits for any particular month and position (McEwen, 1916), form our main criteria for isolating erroneous observations.

Among the observations thus isolated, the temperatures are usually so correlated with the corresponding salinities as to suggest errors in depth rather than in either temperature or salinity. Accordingly, the depth is regarded as unknown and is determined indirectly from the temperature, and checked by a similar determination from the corresponding salinity. If both agree, it is concluded that the thermometers reversed and the water bottle closed at the depth thus indicated, and the data are so tabulated. Usually, only a few erroneous observations remain which cannot be thus corrected, and these are rejected if it is clear that the values will be misleading; otherwise, they are retained but questioned. It may be well to add that defective plankton hauls, while corrected for depth errors when possible, are never rejected.

B. TABULATION OF DATA

1. GENERAL EXPLANATION OF TABLES

a. Arrangement.—For convenience in tabulation and reference, the data are presented in three tables. The hydrographic data, because of their intrinsic value, are tabulated first. Therefore the data relative to all temperature and salinity observations made since 1912 in the ocean and in San Diego Bay are tabulated in tables 1 and 2 respectively. Finally, the field data relative to all plankton collected since 1912 for quantitative investigation are tabulated in table 3. All three tables are arranged on the same general plan.

b. Recording of position.—All positions are entered in latitude and longitude measured from Greenwich. Whenever the position is known to have varied by more than one quarter mile during a single collecting period, the latitude and longitude relative to each water sample and net haul are not entered as such: instead, the initial and final position together with this statement are given: "From ..... to ..... the boat drifted (or steamed) from the above to the following position," the blanks being filled in with the times corresponding to the two positions. In all other cases the position corresponding to each observation is entered.

c. Meaning and use of sections.—For readily specifying the approximate position of observations, the region explored has been divided into rectangular sections whose east and west boundaries are five minutes in latitude, and whose north and south boundaries are five minutes in longitude. The exact position of the center of each section is specified by either a *number* giving its distance (in units of 5′) *west*, or a *negative* number giving its distance *east*, of 114° W, and either a *subscript* giving its distance *north* or an *exponent* giving its distance *south* of 32° N. The two base lines, 32° N and 114° W, were chosen entirely with reference to explorations, past and future, of the Scripps Institution, the former in order to avoid the need of large subscripts, and the latter in order to exclude large numbers and avoid the need of referring to observations east of the selected meridian. We did not contemplate making observations south of Cerros Island, which lies in the fourteenth section west of 114° W, but, during the winter of 1914, opportunity was unexpectedly offered for taking a few

samples in the vicinity of the Gulf of California, 109° W. Although those observations made within the gulf itself are not referred to by sections but by the letter *G*, those outside and in the vicinity of the Gulf require another form of reference, whence the use of negative numbers.

Any section cut by the coast line is designated in one of three ways: when its center is within 2°.5 west (or east) of the coast, the *number is bracketed;* when it is within 2°.5 north or south, the *subscript or exponent,* as the case may be, *is bracketed;* when it is within 2°.5 both east or west and north or south, the *entire symbol is bracketed.* For example, $(40)_{10}$ refers to a section whose center is within 2°.5 west of the coast, $55_{(24)}$ to one whose center is within 2°.5 south of the coast, and (39_{10}) to one whose center is within 2°.5 north and west of the coast. A more detailed discussion of "sections" is given on pages 46 to 48 of our former (1915) report, and three maps are published by McEwen (1916) which show the approximate number of observations made from 1901 to 1915 in each section between Point Conception and Cerros Island.

EXPLANATION OF TABLE 1

This table includes the data relative to all the hydrographic observations made in the ocean from 1913 to 1915, inclusive, except those made off Coronado Pier in connection with special observations in San Diego Bay.

First column.—Water-sample numbers entered in chronological order.

Second column.—Time when the sample was obtained, entered to the nearest minute.

Third column.—Section; for explanation see page 217. The letter *G* indicates that the sample was taken in the Gulf of California.

Fourth and fifth columns.—Latitude and longitude entered to the nearest 0°.1 when the error was within 0°.5, and to the nearest minute when the error was larger; for method of tabulating see page 217; for discussion of errors see pages 18 to 21 of our former (1915) report.

Sixth column.—Depth of sample, entered to the nearest meter above and to the nearest five below 200 meters; for discussion of errors see page 20 of our former (1915) report.

Seventh column.—Temperature *in situ;* all surface temperatures were determined by a thermometer (L. Steger, Kiel) reading directly to 0°.2 C, and the values entered may be regarded as accurate to 0°.05 C. Subsurface temperatures were determined by either Richter or Negretti-Zambra reversing thermometers (Helland-Hansen, 1911–1912, pp. 58–62), and the values entered are accurate to within 0°.01–0°.05 C. Omitted entries indicate either that no temperature

was taken or that an error was discovered (see p. 216) whose magnitude made the entry valueless.

Eighth, ninth, and tenth columns.—Specific gravity of the sample under atmospheric pressure, the 1.0 being omitted; $S\frac{0°}{4°}$ — that of the sample at 0° C referred to distilled water at 4°.0 C; $S\frac{17°.5}{17°.5}$ — that of the sample at 17°.5 C referred to distilled water at 17°.5 C; $S\frac{t°}{4°}$ — density *in situ* referred to distilled water at 4°.0 C.

Eleventh column.—Salinity *per mille* determined by the "sinker method" (see former report, 1915, pp. 32–37), unless followed by the letter *P*, which indicates a pycnometer determination (see former report, pp. 28–30). Omission of salinity and specific gravity entries signifies either that no water sample was taken or that an error was discovered whose magnitude made the observation valueless. A question mark (?) indicates that a smaller error in depth, temperature, or salinity is suspected (see p. 216).

Table 1.—Ocean Data

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0°/4°0	Specific gravity: 17°5/17°5	Specific gravity: t°/4°0	Salinity S ‰
			February 14, 1913							
3841	11:25 a.m.	39_7	32° 37.0	117° 14.5	0	13.24	2688	2555	2513	33.45 P
3842	11:44 a.m.	39_7	32 34.5	117 14.5	0	13.6	2692	2559	2513	33.50 P
3843	11:59 a.m.	39_6	32 32.3	117 14.4	0	13.5	2688	2555	2511	33.45 P
3844	12:15 p.m.	39_6	32 30.3	117 14.4	0	13.6	2689	2556	2510	33.46 P
3845	12:30 p.m.	39_6	32 28.3	117 14.4	0	13.5	2689	2556	2512	33.46 P
3846	12:46 p.m.	39_5	32 26.2	117 14.3	0	13.5	2695	2562	2518	33.54 P
3847	12:59 p.m.	39_5	32 24.4	117 14.3	0	13.7	2689	2556	2508	33.46 P
			February 15, 1913							
3848	7:45 a.m.	39_5	32 24.4	117 14.3	8	13.03	2690	2557	2522	33.48
3849	7:55 a.m.	39_5	32 24.4	117 14.3	12	13.23	2691	2558	2519	33.49
3850	8:00 a.m.	39_5	32 24.4	117 14.3	10	13.23	2689	2556	2517	33.47
3851	8:04 a.m.	39_5	32 24.4	117 14.3	7	13.23	2694	2561	2522	33.53
3852	8:08 a.m.	39_5	32 24.4	117 14.3	5	13.33	2696	2563	2522	33.55
3853	8:12 a.m.	39_5	32 24.4	117 14.3	0	13.3	2690	2557	2517	33.48 P
3854	8:45 a.m.	40_4	32 22.4	117 21.2	0	13.8	2692	2559	2509	33.50 P
3855	9:42 a.m.	40_4	32 22.4	117 21.2	0	13.9	2683	2551	2498	33.93 P
3856	9:55 a.m.	40_4	32 22.4	117 21.2	0	13.8	2688	2555	2505	33.45 P
3857	11:42 a.m.	40_4	From 9:55 a.m. to		0	13.9	2688	2555	2503	33.45 P
3858	12:05 p.m.	40_4	2:55 p.m. the boat		0	13.85	2683	2551	2499	33.39 P
3859	12:50 p.m.	40_4	drifted from the		660	5.05	2766	2630	2723	34.42 P
3860	1:15 p.m.	40_4	above position		5	13.83	2688	2555	2504	33.45
3861	1:20 p.m.	40_4	to the following		7	13.78	2688	2555	2505	33.45
3862	1:23 p.m.	40_4	position		10	13.63	2689	2556	2509	33.47
3863	1:26 p.m.	40_4			12	13.58	2689	2556	2510	33.47
3864	1:28 p.m.	40_4			17	13.58	2689	2556	2510	33.47
3865	1:30 p.m.	40_4			15	13.58	2689	2556	2510	33.47
3866	1:32 p.m.	40_4			20	13.53	2688	2555	2510	33.45
3867	1:35 p.m.	40_4			25	13.18	2684	2552	2514	33.40
3868	1:39 p.m.	40_4			30	12.82	2681	2549	2519	33.37
3869	1:43 p.m.	40_4			40	12.92	2687	2554	2521	33.44 P
3870	1:45 p.m.	40_4			50	12.37	2689	2555	2534	33.47
3871	1:50 p.m.	40_3			60	12.04	.....	.....	.....	.....
3872	1:54 p.m.	40_3			75	11.40	2696	2562	2560	33.55
3873	2:00 p.m.	40_3			90	10.90	2705	2572	2578	33.66
3874	2:05 p.m.	40_3			100	10.30	2709	2575	2592	33.71
3875	2:10 p.m.	40_3	32° 16.7	117° 19.0	0	14.1	2686	2554	2479	33.42 P
3876	2:40 p.m.	40_4	32 18.5	117 17.7	0	14.0	2686	2554	2499	33.42 P
3877	3:00 p.m.	39_4	32 20.8	117 16.0	0	14.2	2681	2549	2500	33.36 P
3878	3:20 p.m.	39_5	32 23.0	117 14.0	0	14.0	2686	2554	2499	33.42 P
3879	3:40 p.m.	39_5	32 24.4	117 14.3	0	13.9	2697	2564	2512	33.57 P
			February 16, 1913							
3880	6:40 a.m.	40_4	32 22.4	117 21.2	0	13.4	2694	2561	2519	33.52 P
3881	6:48 a.m.	40_4	32 22.4	117 21.2	1100	3.66	2775	2637	2747	34.53 P
3882	7:20 a.m.	40_4	32 22.4	117 21.2	800	4.60	2771	2633	2733	34.48 P
3883	7:45 a.m.	40_4	32 22.4	117 21.2	500	6.10	2761	2625	2706	34.36 P
3884	8:00 a.m.	40_4	32 22.4	117 21.2	200	.....	2752	2616	.....	34.25 P
3885	8:10 a.m.	40_4	32 22.4	117 21.2	150	9.42	2738	2603	2635	34.07 P
3886	8:14 a.m.	40_4	32 22.4	117 21.2	0	13.5	2692	2559	2515	33.50 P
3887	8:15 a.m.	40_4	32 22.4	117 21.2	125	9.77	2729	2594	2621	33.96 P
3888	8:23 a.m.	40_4	32 22.4	117 21.2	100	10.37	2707	2573	2589	33.69 P
3889	8:29 a.m.	40_4	32 22.4	117 21.2	75	11.47	2700	2566	2563	33.60 P
3890	8:35 a.m.	40_4	32 22.4	117 21.2	60	12.55	2694	2561	2535	33.53 P
3891	8:40 a.m.	40_4	32 22.4	117 21.2	50	12.75	2694	2561	2531	33.53 P
3892	8:45 a.m.	40_4	32 22.4	117 21.2	40	12.88	2692	2559	2526	33.50 P
3893	8:48 a.m.	40_4	32 22.4	117 21.2	30	13.15	2691	2558	2521	33.49 P
3894	8:53 a.m.	40_4	32 22.4	117 21.2	25	13.43	2690	2557	2513	33.48 P
3895	8:55 a.m.	40_4	32 22.4	117 21.2	20	13.48	2688	2555	2511	33.46
3896	8:58 a.m.	40_4	32 22.4	117 21.2	17	13.48	2688	2555	2511	33.46
3897	9:02 a.m.	40_4	32 22.4	117 21.2	15	13.48	.....	.....	.....	.....
3898	9:04 a.m.	40_4	32 22.4	117 21.2	12	13.48	2689	2556	2512	33.47
3899	9:06 a.m.	40_4	32 22.4	117 21.2	10	13.48	2692	2559	2515	33.50 P

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° S— 4°0	Specific gravity: 17°5 S— 17°5	Specific gravity: t° S— 4°0	Salinity S ‰
			February 16, 1913							
3900	9:08 a.m.	40_4	32 22.4	117 21.2	7	13.53	2690	2557	2512	33.48
3901	9:10 a.m.	40_4	32 22.4	117 21.2	5	13.53	2687	2554	2509	33.44
3902	9:12 a.m.	40_4	32 22.4	117 21.2	0	13.6	2689	2556	2510	33.47 P
3903	9:45 a.m.	40_5	32 23.5	117 18.0	152	9.62	2746	2611	2640	34.17 P
3904	9:50 a.m.	40_5	32 23.5	117 18.0	0	13.4	2689	2556	2514	33.47 P
3905	9:53 a.m.	40_5	32 23.5	117 18.0	125	9.92	.....	.....	.....	.....
3906	9:59 a.m.	40_5	32 23.5	117 18.0	100	10.12	2722	2588	2607	33.87 P
3907	10:05 a.m.	40_5	32 23.5	117 18.0	75	10.77	2706	[illegible]	2581	33.68 P
3908	10:10 a.m.	40_5	32 23.5	117 18.0	60	12.17	2691	[illegible]	543	33.52 P
3909	10:15 a.m.	40_5	32 23.5	117 18.0	50	12.62	2691	[illegible]	631	33.49 P
3910	10:18 a.m.	40_5	32 23.5	117 18.0	40	12.67	2691	[illegible]	30	33.49 P
3911	10:22 a.m.	40_5	32 23.5	117 18.0	30	13.18	2690	[illegible]	619	33.48 P
3912	10:26 a.m.	40_5	32 23.5	117 18.0	25	13.23	2691	[illegible]	2619	33.49 P
3913	10:30 a.m.	40_5	32 23.5	117 18.0	20	13.23	2691	[illegible]	2622	33.52 P
3914	10:33 a.m.	40_5	32 23.5	117 18.0	17	13.23	2690	[illegible]	18	33.48 P
3915	10:36 a.m.	40_5	32 23.5	117 18.0	15	13.23	2692	[illegible]	620	33.50 P
3916	10:38 a.m.	40_5	32 23.5	117 18.0	12	13.23	2693	2560	521	33.51 P
3917	10:41 a.m.	40_5	32 23.5	117 18.0	10	13.28	2693	2560	2521	33.51 P
3918	10:43 a.m.	40_5	32 23.5	117 18.0	5	13.38	.....	.....	.....	.....
3919	10:46 a.m.	40_5	32 23.5	117 18.0	75	10.71	.....	.....	.....	.....
3920	10:50 a.m.	40_5	32 23.5	117 18.0	0	13.55	2689	2556	2511	33.46 P
3921	11:00 a.m.	39_5	32 24.0	117 17.0	91	10.40	2715	2581	2596	33.78 P
3922	11:05 a.m.	39_5	32 24.0	117 17.0	0	13.6	2694	2561	2515	33.53 P
3923	11:07 a.m.	39_5	32 24.0	117 17.0	75	10.50	2709	2576	2589	33.71 P
3924	11:12 a.m.	39_5	32 24.0	117 17.0	60	11.92	2698	2565	2552	33.57 P
3925	11:15 a.m.	39_5	32 24.0	117 17.0	50	12.55	2693	2560	2534	33.51 P
3926	11:18 a.m.	39_5	32 24.0	117 17.0	40	12.90	.....	.....	.....	.....
3927	11:22 a.m.	39_5	32 24.0	117 17.0	30	13.15	2694	2561	2524	33.53 P
3928	11:26 a.m.	39_5	32 24.0	117 17.0	25	13.15	.....	.....	.....	.....
3929	11:29 a.m.	39_5	32 24.0	117 17.0	20	13.28	.....	.....	.....	.....
3930	11:33 a.m.	39_5	32 24.0	117 17.0	17	13.30	2691	2558	2518	33.49 P
3931	11:35 a.m.	39_5	32 24.0	117 17.0	15	13.33	2692	2559	2518	33.50 P
3932	11:38 a.m.	39_5	32 24.0	117 17.0	12	13.33	2693	2560	2519	33.51 P
3933	11:40 a.m.	39_5	32 24.0	117 17.0	10	13.38	2692	2559	2517	33.50 P
3934	11:42 a.m.	39_5	32 24.0	117 17.0	5	13.45	2693	2560	2517	33.51 P
3935	11:43 a.m.	39_5	32 24.0	117 17.0	0	13.8	2696	2563	2503	33.55 P
3936	11:55 a.m.	39_5	32 24.1	117 16.3	60	11.23	2705	2572	2571	33.66 P
3937	12:01 p.m.	39_5	32 24.1	117 16.3	0	13.85	.....	.....	.....	.....
3938	12:03 p.m.	39_5	32 24.1	117 16.3	50	12.45	.....	.....	.....	.....
3939	12:07 p.m.	39_5	32 24.1	117 16.3	40	12.83	2690	2557	2515	33.48 P
3940	12:10 p.m.	39_5	32 24.1	117 16.3	30	13.23	2690	2557	2518	33.48 P
3941	12:13 p.m.	39_5	32 24.1	117 16.3	25	13.23	.....	.....	.....	.....
3942	12:17 p.m.	39_5	32 24.1	117 16.3	20	13.28	2693	2560	2520	33.51 P
3943	12:19 p.m.	39_5	32 24.1	117 16.3	17	13.28	2692	2559	2519	33.50 P
3944	12:23 p.m.	39_5	32 24.1	117 16.3	17	13.30	2691	2558	2518	33.49 P
3945	12:26 p.m.	39_5	32 24.1	117 16.3	12	13.33	2690	2557	2516	33.48 P
3946	12:28 p.m.	39_5	32 24.1	117 16.3	10	13.38	2693	2560	2518	33.51 P
3947	12:31 p.m.	39_5	32 24.1	117 16.3	5	13.48	2689	2556	2512	33.46 P
3948	12:32 p.m.	39_5	32 24.1	117 16.3	0	13.8	2688	2555	2505	33.45 P
3949	12:50 p.m.	39_5	32 24.4	117 16.0	25	13.33	2701	2568	2527	33.61 P
3950	12:52 p.m.	39_5	32 24.4	117 16.0	20	13.33	2690	2557	2516	33.48 P
3951	12:56 p.m.	39_5	32 24.4	117 16.0	17	13.40	2690	2557	2515	33.48 P
3952	12:58 p.m.	39_5	32 24.4	117 16.0	0	13.6	2688	2555	2509	33.46
3953	12:59 p.m.	39_5	32 24.4	117 16.0	15	13.33	.....	.....	.....	.....
3954	1:01 p.m.	39_5	32 24.4	117 16.0	12	13.33	2689	2556	2515	33.47 P
3955	1:03 p.m.	39_5	32 24.4	117 16.0	10	13.33	2689	2556	2515	33.47 P
3956	1:06 p.m.	39_5	32 24.4	117 16.0	7	13.48	2687	2554	2510	33.44 P
3957	1:08 p.m.	39_5	32 24.4	117 16.0	5	13.53	2685	2552	2508	33.41 P
			February 17, 1913							
3958	6:08 a.m.	39_7	32 37.0	117 14.5	30	11.73	2693	2560	2550	33.51 P
3959	6:15 a.m.	39_7	32 37.0	117 14.5	25	11.83	2694	2561	2549	33.52 P

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° S 4°0	Specific gravity: 17°5 S 17°5	Specific gravity: t° S 4°0	Salinity S ‰
			February 17, 1913							
3960	6:19 a.m.	39_7	32 37.0	117 14.5	20	11.88	2694	2561	2548	33.52 P
3961	6:23 a.m.	39_7	32 37.0	117 14.5	17	12.03	2689	2556	2540	33.47 P
3962	6:27 a.m.	39_7	32 37.0	117 14.5	15	12.03	2687	2554	2538	33.44 P
3963	6:30 a.m.	39_7	32 37.0	117 14.5	12	12.48	2688	2555	2530	33.46 P
3964	6:32 a.m.	39_7	32 37.0	117 14.5	10	12.83	2690	2557	2525	33.48 P
3965	6:34 a.m.	39_7	32 37.0	117 14.5	7	13.33	.....	.....	.....	.....
3966	6:36 a.m.	39_7	32 37.0	117 14.5	0	13.4	2689	2556	2514	33.47 P
3967	6:37 a.m.	39_7	32 37.0	117 14.5	5	13.38	.....	.....	.....	.....
3968	6:55 a.m.	39_7	32 36.4	117 16.1	61	11.22	2697	2564	2564	33.57 P
3969	7:00 a.m.	39_7	32 36.4	117 16.1	50	11.62	2691	2558	2551	33.49 P
3970	7:04 a.m.	39_7	32 36.4	117 16.1	40	12.03	2685	2552	2536	33.41 P
3971	7:08 a.m.	39_7	32 36.4	117 16.1	30	12.44	2687	2554	2530	33.44 P
3972	7:12 a.m.	39_7	32 36.4	117 16.1	25	12.63	2686	2553	2525	33.42 P
3973	7:15 a.m.	39_7	32 36.4	117 16.1	20	12.83	2686	2553	2521	33.42 P
3974	7:16 a.m.	39_7	32 36.4	117 16.1	0	13.7	2691	2558	2510	33.49 P
3975	7:17 a.m.	39_7	32 36.4	117 16.1	17	13.03	2686	2553	2518	33.42 P
3976	7:20 a.m.	39_7	32 36.4	117 16.1	15	13.11	2687	2554	2518	33.44 P
3977	7:22 a.m.	39_7	32 36.4	117 16.1	12	13.23	2686	2553	2514	33.42 P
3978	7:25 a.m.	39_7	32 36.4	117 16.1	10	13.43	2688	2555	2512	33.46 P
3979	7:27 a.m.	39_7	32 36.4	117 16.1	7	13.68	2686	2553	2505	33.42 P
3980	7:30 a.m.	39_7	32 36.4	117 16.1	5	13.71	2685	2552	2504	33.41 P
3981	7:55 a.m.	39_7	32 34.0	117 17.4	0	13.8	2689	2556	2506	33.47
3982	7:58 a.m.	39_7	32 34.0	117 17.4	91	10.82	2702	2569	2576	33.62 P
3983	8:03 a.m.	39_7	32 34.0	117 17.4	75	.....	2693	2560	.....	33.51 P
3984	8:08 a.m.	39_7	32 34.0	117 17.4	60	11.53	2688	2555	2549	33.46 P
3985	8:12 a.m.	39_7	32 34.0	117 17.4	50	11.92	2686	2553	2540	33.42 P
3986	8:16 a.m.	39_7	32 34.0	117 17.4	40	12.41	2687	2554	2531	33.44 P
3987	8:19 a.m.	39_7	32 34.0	117 17.4	30	12.57	2686	2553	2527	33.42 P
3988	8:22 a.m.	39_7	32 34.0	117 17.4	25	12.73	2685	2552	2522	33.41 P
3989	8:27 a.m.	39_7	32 34.0	117 17.4	20	13.01	2684	2551	2517	33.40 P
3990	8:30 a.m.	39_7	32 34.0	117 17.4	15	13.73	.....	.....	.....	.....
3991	8:32 a.m.	39_7	32 34.0	117 17.4	10	13.78	.....	.....	.....	.....
3992	8:34 a.m.	39_7	32 34.0	117 17.4	5	13.83	2692	2559	2508	33.50 P
3993	8:35 a.m.	39_7	32 34.0	117 17.4	0	13.9	2693	2560	2508	33.51 P
3994	8:58 a.m.	40_7	32 33.0	117 19.0	0	14.0	2684	2551	2497	33.40 P
3995	9:01 a.m.	40_7	32 33.0	117 19.0	166	9.40	2738	2602	2635	34.07 P
3996	9:10 a.m.	40_7	32 33.0	117 19.0	125	9.92	2729	2594	2618	33.96 P
3997	9:16 a.m.	40_7	32 33.0	117 19.0	75	.....	2696	2562	.....	33.55 P
3998	9:20 a.m.	40_7	32 33.0	117 19.0	50	12.02	2687	2554	2539	33.44
3999	9:24 a.m.	40_7	32 33.0	117 19.0	30	12.77	2685	2552	2522	33.41
4000	9:27 a.m.	40_7	32 33.0	117 19.0	20	13.38	2685	2552	2510	33.41
4001	9:29 a.m.	40_7	32 33.0	117 19.0	15	13.73	2688	2555	2506	33.46
4002	9:30 a.m.	40_7	32 33.0	117 19.0	0	14.1	2687	2554	2498	33.44
4003	9:45 a.m.	40_7	32 34.6	117 19.0	0	14.1	2687	2554	2498	33.44
4004	10:00 a.m.	40_7	32 36.2	117 19.0	0	14.15	2685	2552	2495	33.41
4005	10:15 a.m.	40_8	32 37.8	117 19.0	0	14.1	2690	2557	2501	33.48
4006	10:30 a.m.	40_8	32 39.4	117 19.0	0	14.1	2692	2559	2503	33.50
4007	10:45 a.m.	40_8	32 41.0	117 19.0	0	14.0	2685	2552	2498	33.41
4008	11:00 a.m.	40_9	32 42.6	117 19.0	0	14.3	2689	2556	2496	33.47 P
4009	11:15 a.m.	40_9	32 44.2	117 19.0	0	14.1	2687	2554	2498	33.44
4010	11:30 a.m.	40_9	32 45.8	117 19.0	0	13.9	2690	2557	2505	33.48
4011	11:59 a.m.	$(40)_{10}$	32 51.0	117 18.5	0	13.6	2691	2558	2512	33.49 P
4012	12:15 p.m.	(39_{10})	32 51.3	117 16.5	0	14.2	2689	2556	2498	33.47 P
4013	1:20 p.m.	(39_{10})	32 51.3	117 16.5	0	14.3	2691	2558	2503	33.49 P
4014	1:45 p.m.	$(40)_{10}$	32 50.0	117 18.0	0	14.0	2691	2558	2504	33.49 P
4015	2:00 p.m.	$(40)_{10}$	32 48.0	117 17.8	0	14.0	2689	2556	2502	33.47 P
4016	2:15 p.m.	40_9	32 46.1	117 17.6	0	13.8	2692	2559	2509	33.50 P
4017	2:30 p.m.	40_9	32 44.1	117 17.7	0	13.9	2695	2562	2510	33.54 P
4018	2:45 p.m.	(39_8)	32 42.1	117 17.3	0	14.0	2691	2558	2504	33.49 P
4019	3:00 p.m.	(39_8)	32 40.1	117 17.0	0	14.0	2688	2555	2501	33.46 P
4020	3:10 p.m.	(39_8)	32 38.8	117 16.7	0	14.0	2689	2556	2502	33.47 P

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position		Depth in meters	Temperature in centigrade	Specific gravity			Salinity $S\,^0/_{00}$
			North latitude	West longitude			0° S—— 4°0	17°5 S—— 17°5	t° S—— 4°0	
			April 15, 1913							
4021	1:10 p.m.	$(39_{7.5})$	32 37.5	117 14.5	0	13.3	.....	.....	.....	.....
4022	1:35 p.m.	(39_8)	32 40.0	117 16.2	0	14.7	2712	2578	2510	33.75
4023	1:45 p.m.	(39_c)	32 41.0	117 16.6	0	14.75	2702	2569	2499	33.63
4024	2:00 p.m.	$(39_{8.5})$	32 42.5	117 17.1	0	14.75	2712	2578	2509	33.75
4025	2:15 p.m.	40_9	32 44.1	117 17.6	0	14.7	2701	2568	2499	33.61
4026	2:30 p.m.	40_9	32 45.7	117 17.8	0	14.65	2700	2567	2499	33.60
4027	2:45 p.m.	40_9	32 47.4	117 18.0	0	14.6	2703	2570	2503	33.64
4028	3:00 p.m.	$(40)_{10}$	32 49.1	117 18.2	0	14.9	2702	2569	2496	33.63
4029	3:15 p.m.	$(40)_{10}$	32 50.8	117 18.4	0	14.9	2712	2578	2506	33.75
4030	3:25 p.m.	(39_{10})	32 51.5	117 16.5	0	15.45	2711	2577	2493	33.74
			April 16, 1913							
4031	6:05 a.m.	40_4	32 22.4	117 21.2	0	13.8	2695	2562	2512	33.54
4032	6:25 a.m.	40_4	32 22.4	117 21.2	0	13.75	.....	.....	.....	.....
4033	7:33 a.m.	40_4	32 22.4	117 21.2	0	13.7	2699	2566	2518	33.58
4034	8:00 a.m.	40_4	32 22.4	117 21.2	0	13.8	2701	2568	2518	33.61
4035	8:19 a.m.	40_4	32 22.4	117 21.2	500	6.39	.....	.....	.....	.....
4036	8:29 a.m.	40_4	32 22.4	117 21.2	500	6.36	2757	2621	2698	34.31
4037	8:57 a.m.	40_4	32 22.4	117 21.2	0	14.1	2698	2565	2509	33.58
4038	9:04 a.m.	40_4	32 22.4	117 21.2	400	7.08	.....	.....	.....	.....
4039	9:13 a.m.	40_4	32 22.4	117 21.2	400	7.08	2758	2622	2690	34.33
4040	9:50 a.m.	40_4	32 22.4	117 21.2	0	14.2	2702	2569	2511	33.63
4041	9:57 a.m.	40_4	32 22.4	117 21.2	300	8.39	2757	2621	2669	34.31
4042	10:17 a.m.	40_4	32 22.4	117 21.2	150	9.22	2752	2616	2652	34.25
4043	10:25 a.m.	40_4	32 22.4	117 21.2	200	.....	2756	2620	.....	34.30
4044	10:40 a.m.	40_4	32 22.4	117 21.2	140	8.88	2742	2607	2647	34.13
4045	10:42 a.m.	40_4	32 22.4	117 21.2	0	14.4	2712	2578	2516	33.75
4046	10:59 a.m.	40_4	32 22.4	117 21.2	125	9.00	2735	2600	2639	34.04
4047	11:25 a.m.	40_4	32 22.4	117 21.2	100	9.41	2733	2598	2630	34.01
4048	11:26 a.m.	40_4	32 22.4	117 21.2	0	14.5	2713	2579	2515	33.76
4049	11:41 a.m.	40_4	32 22.4	117 21.2	75	9.60	.....	.....	.....	.....
4050	11:47 a.m.	40_4	32 22.4	117 21.2	75	9.60	.....	.....	.....	
4051	11:59 a.m.	40_4	32 22.4	117 21.2	60	9.87	2710	2576	2601	33.73
4052	12:01 p.m.	40_4	32 22.4	117 21.2	0	14.6	2695	2562	2495	33.54
4053	12:05 p.m.	40_4	32 22.4	117 21.2	60	9.81	2714	2580	2606	33.78
4054	12:45 p.m.	40_4	32 22.4	117 21.2	50	10.10	2709	2575	2595	33.71
4055	12:47 p.m.	40_4	32 22.4	117 21.2	0	14.6	2711	2577	2511	33.74
4056	12:52 p.m.	40_4	From 12:47 p.m. to		50	10.02	2713	2579	2601	33.76
4057	1:03 p.m.	40_4	1:45 p.m. the boat		40	10.15	.....	.....	.....	.....
4058	1:05 p.m.	40_4	drifted from the		30	10.53	.....	.....	.....	
4059	1:05 p.m.	40_4	above position		30	10.78	2702	2569	2576	33.63
4060	1:09 p.m.	40_4	to the following		25	11.41	2701	2568	2565	33.61
4061	1:09 p.m.	40_4	position		25	11.21	2702	2569	2569	33.62
4062	1:13 p.m.	40_4			20	12.12	2699	2566	2549	33.59
4063	1:13 p.m.	40_4			20	12.22	2698	2565	2546	33.58
4064	1:19 p.m.	40_5			13	13.23	2698	2565	2526	33.58
4065	1:19 p.m.	40_5			13	13.23	2699	2566	2527	33.59
4066	1:24 p.m.	40_5			15	13.03	2697	2564	2529	33.57
4067	1:24 p.m.	40_5			15	12.93	2700	2567	2533	33.60
4068	1:28 p.m.	40_5			12	13.54	2699	2566	2521	33.59
4069	1:28 p.m.	40_5			12	13.54	2699	2566	2521	33.59
4070	1:32 p.m.	40_5			10	13.59	2699	2566	2520	33.59
4071	1:32 p.m.	40_5			10	13.59	2698	2565	2519	33.58
4072	1:35 p.m.	40_5			7	13.74	2699	2566	2517	33.59
4073	1:35 p.m.	40_5			7	13.74	2700	2567	2518	33.60
4074	1:38 p.m.	40_5			5	14.04	2700	2567	2512	33.60
4075	1:38 p.m.	40_5			5	13.17	2698	2565	2508	33.58
4076	1:45 p.m.	40_5	32° 22'6	117° 20'0	0	14.4	2698	2565	2502	33.58
			April 17, 1913							
4077	5:54 a.m.	40_4	32 22.4	117 21.2	5	14.50	.....	.....	.....	.....
4078	5:57 a.m.	40_4			0	14.2	2701	2568	2510	33.61
4079	6:05 a.m.	40_4			5	14.17	2699	2566	2509	33.59

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° S — 4°0	Specific gravity: 17°5 S — 17°5	Specific gravity: t° S — 4°0	Salinity S ‰
			April 17, 1913							
4080	6:05 a.m.	40_4	From 5:48 a.m. to		5	14.25	2698	2565	2506	33.58
4081	6:10 a.m.	40_4	8:50 a.m. the boat		7	14.12	2695	2562	2506	33.54
4082	6:16 a.m.	40_4	drifted from the		7	14.15	2696	2563	2506	33.55
4083	6:22 a.m.	40_4	above position		10	13.34	2696	2563	2522	33.55
4084	6:28 a.m.	40_4	to the following		10	13.75	2697	2564	2515	33.57
4085	6:33 a.m.	40_4	position		12	13.43	2694	2561	2518	33.63
4086	6:37 a.m.	40_4			0	14.2	2699	2566	2508	33.59
4087	6:40 a.m.	40_4			12	13.54	2695	2562	2517	33.54
4088	6:52 a.m.	40_4			15	12.12	.....	.....	.....	.....
4089	7:15 a.m.	40_4			15	.....	2698	2565	.....	33.58
4090	7:15 a.m.	40_4			15	12.71	2696	2563	2534	33.55
4091	7:23 a.m.	40_4			0	14.3	2698	2565	2505	33.58
4092	7:25 a.m.	40_4			17	12.28	2698	2565	2544	33.58
4093	7:46 a.m.	40_5			20	11.93	2699	2566	2552	33.59
4094	7:57 a.m.	40_5			0	14.4	2698	2565	2502	33.58
4095	8:17 a.m.	40_5			25	.....	2699	2566	.....	33.59
4096	8:23 a.m.	40_5			25	11.22	2699	2566	2566	33.59
4097	8:28 a.m.	40_5			30	10.92	2698	2565	2571	33.58
4098	8:34 a.m.	40_5			30	11.00	2700	2567	2571	33.60
4099	8:38 a.m.	40_5	32° 22.6	117° 22.1	0	14.5	2701	2568	2503	33.61
4100	9:15 a.m.	40_4	32 22.4	117 21.2	40	10.26	.....	.....	.....	.....
4101	9:20 a.m.	40_4	32 22.4	117 21.2	50	9.91	2708	2574	2598	33.71
4102	9:26 a.m.	40_4	32 22.4	117 21.2	60	9.70	2716	2582	2609	33.80
4103	9:35 a.m.	40_4	32 22.4	117 21.2	100	9.21	2725	2590	2626	33.91
4104	9:40 a.m.	40_4	32 22.4	117 21.2	125	9.05	2739	2601	2642	34.09
4105	10:00 a.m.	40_4	32 22.4	117 21.2	150	9.01	2745	2610	2649	34.16
4106	10:25 a.m.	40_4	32 22.4	117 21.2	0	14.9	2697	2564	2491	33.57
4107	10:27 a.m.	40_4	32 22.4	117 21.2	300	8.52	2760	2624	2670	34.35
4108	10:43 a.m.	40_4	32 22.4	117 21.2	400	7.35	2759	2623	2687	34.34
4109	11:15 a.m.	40_4	32 22.4	117 21.2	500	6.58	2763	2627	2701	34.39
4110	11:16 a.m.	40_4	32 22.4	117 21.2	0	14.8	2695	2562	2491	33.54
4111	12:02 p.m.	40_5	32 23.5	117 18.0	0	15.1	2707	2574	2497	33.69
4112	12:05 p.m.	40_5	32 23.5	117 18.0	150	.....	2748	2612	.....	34.20
4113	12:43 p.m.	40_5	32 23.5	117 18.0	125	9.10	2737	2602	2639	34.06
4114	12:48 p.m.	40_5	32 23.5	117 18.0	100	9.57	2729	2594	2624	33.96
4115	12:50 p.m.	40_5	32 23.5	117 18.0	0	15.0	2700	2567	2492	33.60
4116	12:53 p.m.	40_5	32 23.5	117 18.0	75	9.84	2724	2589	2614	33.90
4117	1:02 p.m.	40_5	32 23.5	117 18.0	60	9.97	2713	2579	2601	33.76
4118	1:08 p.m.	40_5	32 23.5	117 18.0	50	10.20	2712	2578	2578	33.75
4119	1:12 p.m.	40_5	32 23.5	117 18.0	40	10.15	2706	2573	2596	33.68
4120	1:16 p.m.	40_5	32 23.5	117 18.0	30	10.61	.....	.....	.....	.....
4121	1:20 p.m.	40_5	32 23.5	117 18.0	25	11.12	2696	2563	2565	33.55
4122	1:30 p.m.	40_5	32 23.5	117 18.0	20	11.78	2697	2564	2553	33.57
4123	1:34 p.m.	40_5	32 23.5	117 18.0	17	12.90	2696	2563	2530	33.56
4124	1:38 p.m.	40_5	32 23.5	117 18.0	15	13.11	2695	2562	2526	33.54
4125	1:41 p.m.	40_5	32 23.5	117 18.0	12	13.50	2696	2563	2519	33.55
4126	1:45 p.m.	40_5	32 23.5	117 18.0	10	14.13	2697	2564	2507	33.57
4127	1:48 p.m.	40_5	32 23.5	117 18.0	7	14.35	2699	2566	2505	33.59
4128	1:50 p.m.	40_5	32 23.5	117 18.0	5	14.51	2698	2565	2500	33.58
4129	1:52 p.m.	40_5	32 23.5	117 18.0	0	14.7	2707	2674	2505	33.69
			April 18, 1913							
4130	6:18 a.m.	39_7	32 37.4	117 14.4	5	12.74	2710	2576	2547	33.73
4131	6:21 a.m.	39_7	32 37.4	117 14.4	0	12.75	2710	2576	2547	33.73
4132	6:56 a.m.	39_7	32 36.2	117 17.0	62	9.71	2724	2589	2616	33.90
4133	7:04 a.m.	39_7	32 36.2	117 17.0	50	10.04	2714	2580	2601	33.78
4134	7:05 a.m.	39_7	32 36.2	117 17.0	0	12.9	2709	2575	2543	33.71
4135	7:11 a.m.	39_7	32 36.2	117 17.0	40	10.14	2714	2580	2600	33.78
4136	7:16 a.m.	39_7	32 36.2	117 17.0	30	10.22	2713	2579	2598	33.76
4137	7:21 a.m.	39_7	32 36.2	117 17.0	25	10.50	2710	2576	2600	33.73
4138	7:26 a.m.	39_7	32 36.2	117 17.0	20	10.78	2709	2575	2583	33.71

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position				Depth in meters	Temperature in centigrade	Specific gravity			Salinity S ‰
			North latitude		West longitude				0° / 4°.0 S	17°.5 / 17°.5 S	t° / 4°.0 S	
			April 18, 1913									
4139	7:31 a.m.	39_7	32	36.2	117	17.0	17	11.23	2707	2573	2573	33.69
4140	7:35 a.m.	39_7	32	36.2	117	17.0	15	11.43	2707	2573	2570	33.69
4141	7:40 a.m.	39_7	32	36.2	117	17.0	12	11.94	2706	2572	2559	33.68
4142	7:44 a.m.	39_7	32	36.2	117	17.0	10	11.89	2708	2574	2562	33.70
4143	7:47 a.m.	39_7	32	36.2	117	17.0	7	12.74	2706	2572	2543	33.68
4144	7:51 a.m.	39_7	32	36.2	117	17.0	5	12.95	2707	2573	2540	33.69
4145	7:54 a.m.	39_7	32	36.2	117	17.0	0	13.0	2705	2572	2538	33.67
4146	8:20 a.m.	40_7	32	34.9	117	18.0	75	9.52	2728	2593	2624	33.95
4147	8:21 a.m.	40_7	32	34.9	117	18.0	0	13.25	2708	2574	2536	33.70
4148	8:22 a.m.	40_7	32	34.9	117	18.0	60	9.94	2718	2583	2607	33.83
4149	8:32 a.m.	40_7	32	34.9	117	18.0	50	10.10	2717	2583	2603	33.83
4150	8:38 a.m.	40_7	32	34.9	117	18.0	40	10.41	2712	2578	2593	33.75
4151	8:43 a.m.	40_7	32	34.9	117	18.0	30	10.54	2710	2576	2589	33.73
4152	8:48 a.m.	40_7	32	34.9	117	18.0	25	11.53	2711	2577	2572	33.74
4153	8:54 a.m.	40_7	32	34.9	117	18.0	20	12.13	2708	2574	2557	33.70
4154	8:59 a.m.	40_7	32	34.9	117	18.0	17	12.63	2708	2574	2547	33.70
4155	9:03 a.m.	40_7	32	34.9	117	18.0	15	13.06	2707	2573	2539	33.69
4156	9:08 a.m.	40_7	32	34.9	117	18.0	12	13.17	2706	2572	2536	33.68
4157	9:12 a.m.	40_7	32	34.9	117	18.0	10	13.16	2707	2573	2537	33.69
4158	9:16 a.m.	40_7	32	34.9	117	18.0	7	13.13	2706	2572	2536	33.68
4159	9:20 a.m.	40_7	32	34.9	117	18.0	5	13.13	2707	2573	2537	33.69
4160	9:24 a.m.	40_7	32	34.9	117	18.0	15	13.09	2707	2573	2538	33.69
4161	9:25 a.m.	40_7	32	34.9	117	18.0	0	.....	2710	2576	.....	33.73
4162	9:56 a.m.	40_7	32	36.0	117	21.5	119	9.14	.....	.....	.....	.....
4163	10:12 a.m.	40_7	32	36.0	117	21.5	0	14.5	2707	2573	2509	33.69
4164	10:14 a.m.	40_7	32	36.0	117	21.5	100	9.36	2734	2598	2632	34.02
4165	10:21 a.m.	40_7	32	36.0	117	21.5	75	9.85	2721	2587	2611	33.87
4166	10:27 a.m.	40_7	32	36.0	117	21.5	60	10.22	2721	2587	2605	33.87
4167	10:33 a.m.	40_7	32	36.0	117	21.5	50	10.42	2707	2573	2588	33.69
4168	10:37 a.m.	40_7	32	36.0	117	21.5	40	10.47	2707	2573	2587	33.69
4169	10:43 a.m.	40_7	32	36.0	117	21.5	30	.....	2702	2568	.....	33.62
4170	10:50 a.m.	40_7	32	36.0	117	21.5	25	11.23	2699	2565	2565	33.58
4171	10:54 a.m.	40_7	32	36.0	117	21.5	20	11.42	2694	2561	2558	33.53
4172	10:58 a.m.	40_7	32	36.0	117	21.5	17	12.23	2692	2559	2539	33.50
4173	11:03 a.m.	40_7	32	36.0	117	21.5	15	12.88	2693	2560	2537	33.51
4174	11:07 a.m.	40_7	32	36.0	117	21.5	12	13.53	2694	2561	2516	33.53
4175	11:10 a.m.	40_7	32	36.0	117	21.5	10	13.61	2695	2562	2516	33.54
4176	11:13 a.m.	40_7	32	36.0	117	21.5	7	13.71	2696	2562	2515	33.55
4177	11:16 a.m.	40_7	32	36.0	117	21.5	5	14.09	2697	2564	2508	33.57
4178	11:20 a.m.	40_7	32	36.0	117	21.5	0	14.6	2693	2560	2493	33.51
4179	11:43 a.m.	41_7	32	35.5	117	23.0	0	.....	2697	2564	.....	33.57
			August 5, 1913									
4180	6:22 p.m.	(39_4)	32	38.1	117	15.4	0	19.0	2702	2568	2399	33.62
4181	6:40 p.m.	(39_8)	32	39.7	117	16.9	0	19.0	2703	2569	2400	33.64
4182	7:00 p.m.	40_8	32	41.4	117	18.5	0	20.4	2707	2573	2367	33.69
4183	7:20 p.m.	40_9	32	43.1	117	20.0	0	20.6	2697	2564	2352	33.57
4184	7:40 p.m.	40_9	32	44.8	117	21.6	0	20.6	2696	2562	2351	33.55
4185	8:00 p.m.	41_9	32	46.5	117	23.2	0	20.5	2704	2571	2361	33.66
4186	8:20 p.m.	41_{10}	32	48.2	117	24.9	0	20.85	2702	2568	2350	33.62
4187	8:40 p.m.	41_{10}	32	49.9	117	26.4	0	21.05	2704	2571	2347	33.66
4188	9:00 p.m.	42_{10}	32	51.6	117	28.0	0	21.0	2705	2572	2349	33.67
4189	9:20 p.m.	42_{11}	32	53.4	117	29.6	0	20.7	2704	2571	2356	33.66
4190	9:40 p.m.	42_{11}	32	55.0	117	31.2	0	20.3	2705	2572	2368	33.67
4191	10:00 p.m.	43_{11}	32	56.8	117	32.7	0	20.35	2704	2571	2366	33.66
4192	10:20 p.m.	43_{12}	32	58.5	117	33.3	0	20.1	2708	2574	2376	33.70
4193	10:40 p.m.	43_{12}	33	0.1	117	35.9	0	19.5	2701	2567	2385	33.61
4194	11:00 p.m.	43.5_{12}	33	1.9	117	37.5	0	19.25	2703	2569	2393	33.64
4195	11:20 p.m.	44_{12}	33	3.6	117	39.1	0	19.6	2702	2568	2383	33.62
4196	11:40 p.m.	44_{13}	33	5.3	117	40.7	0	19.1	2703	2569	2398	33.64
4197	11:59 p.m.	44_{13}	33	7.0	117	42.3	0	19.05	2704	2571	2400	33.66

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° S — 4°0	Specific gravity: 17°5 S — 17°5	Specific gravity: t° S — 4°0	Salinity S‰
			August 6, 1913							
4198	12:20 a.m.	45_{14}	33 8.7	117 43.8	0	20.35	2702	2568	2364	33.62
4199	12:40 a.m.	45_{14}	33 10.4	117 45.5	0	20.45	2706	2572	2364	33.68
4200	1:00 a.m.	45_{14}	33 12.1	117 47.0	0	20.3	2702	2568	2365	33.62
4201	1:20 a.m.	46_{15}	33 13.8	117 48.6	0	20.35	2710	2576	2372	33.73
4202	1:40 a.m.	46_{15}	33 15.5	117 50.2	0	20.25	2708	2574	2372	33.70
4203	2:00 a.m.	46_{15}	33 17.2	117 51.8	0	19.45	2701	2567	2387	33.61
4204	2:20 a.m.	47_{16}	33 18.9	117 53.4	0	19.75	2699	2565	2377	33.58
4205	2:40 a.m.	47_{16}	33 20.6	117 55.0	0	18.65	2694	2561	2400	33.53
4206	3:05 a.m.	47_{17}	33 22.7	117 57.0	0	18.5	2700	2566	2410	33.60
4207	3:20 a.m.	48_{17}	33 24.0	117 58.2	0	18.25	2696	2562	2412	33.55
4208	3:40 a.m.	48_{17}	33 25.7	117 59.7	0	17.8	2700	2566	2427	33.60
4209	4:00 a.m.	48_{17}	33 27.4	118 1.3	0	17.8	2697	2564	2424	33.57
4210	4:20 a.m.	49_{18}	33 29.1	118 2.9	0	17.8	2694	2561	2421	33.53
4211	4:40 a.m.	49_{18}	33 30.8	118 4.5	0	17.8	2699	2565	2426	33.58
4212	5:00 a.m.	$49_{18.5}$	33 32.5	118 6.1	0	17.65	2697	2564	2428	33.57
4213	5:20 a.m.	50_{19}	33 34.1	118 7.7	0	17.15	2697	2564	2440	33.57
4214	5:40 a.m.	50_{19}	33 35.8	118 9.1	0	16.55	2692	2559	2448	33.50
4215	6:00 a.m.	50_{19}	33 37.1	118 10.0	0	17.4	2698	2565	2434	33.58
4216	6:20 a.m.	50_{20}	33 38.9	118 11.2	0	16.95	2698	2565	2445	33.58
4217	6:40 a.m.	50_{20}	33 40.6	118 12.4	0	14.7	2695	2562	2493	33.54
4218	7:00 a.m.	51_{20}	33 42.4	118 13.6	0	16.2	2690	2557	2454	33.48
4219	7:20 a.m.	(51_{21})	33 44.2	118 14.8	0	17.4	2693	2560	2429	33.51
4220	7:30 a.m.	(51_{21})	33 43.7	118 15.3	0	16.8	2693	2560	2443	33.51
4221	7:40 a.m.	(51_{21})	33 43.3	118 15.6	0	16.5	2690	2557	2447	33.48
4222	7:45 a.m.	51_{20}	33 42.2	118 15.4	0	15.3	2694	2561	2479	33.53
4223	8:05 a.m.	51_{20}	33 41.7	118 17.4	0	16.2	2694	2561	2458	33.53
4224	8:21 a.m.	$(52_{20.5})$	33 42.5	118 19.7	0	15.8	2693	2560	2467	33.51
4225	8:35 a.m.	(52_{21})	33 43.3	118 22.4	0	15.6	2696	2562	2475	33.55
4226	9:05 a.m.	(53_{24})	33 44.0	118 25.0	0	14.5	2692	2559	2494	33.50
4227	9:18 a.m.	(53_{21})	33 45.2	118 26.0	0	15.0	2697	2564	2489	33.57
4228	9:30 a.m.	(53_{21})	33 46.5	118 26.7	0	18.2	2703	2569	2420	33.64
4229	9:43 a.m.	(53_{22})	33 47.8	118 25.0	0	19.0	2701	2567	2398	33.61
4230	9:56 a.m.	(53_{22})	33 49.6	118 23.8	0	20.0	2701	2567	2372	33.61
4231	10:05 a.m.	(53_{22})	33 49.8	118 24.0	0	19.9	2701	2567	2375	33.61
4232	10:40 a.m.	$(53_{22.5})$	33 52.5	118 25.0	0	20.1	2702	2568	2370	33.62
4233	11:00 a.m.	(53_{24})	33 56.0	118 27.0	0	19.8	2704	2571	2380	33.66
4234	11:24 a.m.	(54_{24})	33 59.0	118 28.8	0	19.9	2697	2564	2371	33.57
4235	11:36 a.m.	(54_{24})	34 0.4	118 30.0	0	19.7	2698	2565	2377	33.58
4236	11:55 a.m.	(54.5_{24})	34 1.1	118 32.5	0	19.4	2701	2567	2388	33.61
4237	12:25 p.m.	$55_{(24)}$	34 1.0	118 36.4	0	20.5	2702	2568	2359	33.62
4238	12:40 p.m.	$56_{(24)}$	34 0.9	118 38.5	0	19.8	2702	2568	2378	33.62
4239	1:00 p.m.	$56_{(24)}$	34 0.9	118 41.1	0	19.6	2701	2567	2382	33.61
4240	1:20 p.m.	(57_{24})	34 0.8	118 43.8	0	19.5	2711	2577	2395	33.74
4241	1:40 p.m.	(57_{24})	34 0.8	118 46.4	0	19.1	2707	2573	2402	33.69
			August 7, 1913							
4242	4:52 a.m.	(57_{24})	34 0.8	118 46.4	0	18.2	2701	2567	2418	33.61
4243	5:05 a.m.	(58_{24})	33 59.4	118 48.4	0	18.4	2703	2569	2415	33.64
4244	5:20 a.m.	(58_{24})	34 0.4	118 49.1	0	16.2	2702	2568	2466	33.62
4245	5:25 a.m.	(58_{24})	34 0.8	118 50.0	0	16.0	.....	.....	.....	.....
4246	5:30 a.m.	(58_{24})	34 1.3	118 51.0	0	16.6	2694	2561	2449	33.53
4247	5:35 a.m.	(58_{24})	34 1.6	118 52.0	0	16.95	.....	.....	.....	.....
4248	5:42 a.m.	$59_{(24)}$	34 1.8	118 53.2	0	15.8	2695	2562	2469	33.54
4249	5:45 a.m.	$59_{(24)}$	34 2.0	118 53.7	0	15.6	.....	.....	.....	.....
4250	5:50 a.m.	$59_{(24)}$	34 2.0	118 54.2	0	15.7	2692	2559	2469	33.50
4251	5:55 a.m.	$59_{(24)}$	34 2.1	118 55.7	0	15.4	.....	.....	.....	.....
4252	6:02 a.m.	$59_{(24)}$	34 2.1	118 56.2	0	14.8	2693	2560	2484	33.52
4253	6:10 a.m.	$59_{(24)}$	34 2.3	118 56.5	0	15.0	2692	2559	2484	33.50
4254	6:22 a.m.	$(59.5_{24.5})$	34 2.5	118 57.5	0	15.2	2693	2560	2481	33.51
4255	6:28 a.m.	(60_{25})	34 2.8	118 57.8	0	15.5	2696	2562	2477	33.55
4256	6:35 a.m.	(60_{25})	34 3.6	118 59.9	0	15.95	2696	2562	2467	33.55
4257	6:45 a.m.	(60_{25})	34 4.1	119 1.5	0	15.9	.....	.....	.....	.....

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° S — 4°0	Specific gravity: 17°5 S — 17°5	Specific gravity: t° S — 4°0	Salinity S ‰
			August 7, 1913							
4258	6:50 a.m.	(60_{25})	34 4.5	119 2.4	0	15.15	2692	2559	2481	33.50
4259	6:52 a.m.	$60_{(25)}$	34 4.6	119 3.0	0	14.3	2697	2564	2504	33.57
4260	6:57 a.m.	$61_{(25)}$	34 4.8	119 3.8	0	14.5	2698	2565	2500	33.58
4261	7:01 a.m.	$61_{(25)}$	34 4.9	119 4.3	0	14.4	2699	2565	2503	33.58
4262	7:05 a.m.	$61_{(25)}$	34 5.1	119 4.9	0	14.2	2702	2568	2511	33.62
4263	7:10 a.m.	$61_{(25)}$	34 5.2	119 5.6	0	14.0	2702	2568	2515	33.62
4264	7:12 a.m.	$61_{(25)}$	34 5.2	119 5.8	0	14.0	.....	.....	.....	.....
4265	7:15 a.m.	$61_{(25)}$	34 5.2	119 6.2	0	13.85	2704	2571	2520	33.66
4266	7:18 a.m.	$61_{(25)}$	34 5.3	119 6.6	0	13.8	2700	2566	2517	33.60
4267	7:21 a.m.	$61_{(25)}$	34 5.3	119 7.1	0	14.8	.....	.....	.....	.....
4268	7:26 a.m.	(62_{25})	34 5.4	119 7.7	0	14.9	2698	2565	2492	33.58
4269	7:28 a.m.	(62_{25})	34 5.4	119 8.0	0	14.7	2699	2565	2497	33.59
4270	7:40 a.m.	$61_{(25)}$	34 5.3	119 6.7	10	12.72	2687	2554	2525	33.44
4271	7:45 a.m.	$61_{(25)}$	34 5.3	119 6.7	7	13.02	2688	2555	2521	33.46
4272	7:47 a.m.	$61_{(25)}$	34 5.3	119 6.7	5	13.32	2693	2560	2520	33.51
4273	7:48 a.m.	$61_{(25)}$	34 5.3	119 6.7	0	13.9	2700	2566	2515	33.60
4274	8:06 a.m.	(62_{25})	34 5.2	119 7.6	12	12.43	2690	2557	2533	33.48
4275	8:08 a.m.	(62_{25})	34 5.2	119 7.6	10	12.48	2688	2555	2530	33.46
4276	8:11 a.m.	(62_{25})	34 5.2	119 7.6	7	12.64	2691	2558	2530	33.49
4277	8:12 a.m.	(62_{25})	34 5.2	119 7.6	5	13.04	2692	2559	2524	33.50
4278	8:12 a.m.	(62_{25})	34 5.2	119 7.6	0	13.55	2699	2565	2521	33.58
4279	8:21 a.m.	(62_{25})	34 4.7	118 8.7	0	14.9	2695	2562	2489	33.54
4280	8:29 a.m.	(62_{25})	34 4.1	119 9.8	0	16.3	2698	2565	2460	33.58
4281	8:37 a.m.	(62_{25})	34 3.5	119 11.0	0	16.55	2704	2571	2460	33.66
4282	8:47 a.m.	(62_{25})	34 3.5	119 11.0	150	9.01	2728	2593	2632	33.95
4283	8:55 a.m.	(62_{25})	34 3.5	119 11.0	125	9.21	.	.	. .	.....
4284	9:02 a.m.	(62_{25})	34 3.5	119 11.0	100	9.44	.....	.....	.....	.....
4285	9:07 a.m.	(62_{25})	34 3.5	119 11.0	75	10.16	2707	2573	2592	33.69 P
4286	9:12 a.m.	(62_{25})	34 3.5	119 11.0	60	10.46	2700	2566	2580	33.60
4287	9:16 a.m.	(62_{25})	34 3.5	119 11.0	50	11.22	2688	2555	2555	33.46
4288	9:20 a.m.	(62_{25})	34 3.5	119 11.0	40	11.92	2688	2555	2541	33.46
4289	9:25 a.m.	(62_{25})	34 3.5	119 11.0	30	13.38	2692	2559	2517	33.50
4290	9:28 a.m.	(62_{25})	34 3.5	119 11.0	25	13.93	2694	2561	2508	33.53
4291	9:32 a.m.	(62_{25})	34 3.5	119 11.0	20	14.46	2696	2562	2499	33.55
4292	9:38 a.m.	(62_{25})	34 3.5	119 11.0	17	14.64	2697	2564	2496	33.57
4293	9:40 a.m.	(62_{25})	34 3.5	119 11.0	15	15.07	2694	2561	2485	33.53
4294	9:42 a.m.	(62_{25})	34 3.5	119 11.0	12	15.43	2697	2564	2479	33.57
4295	9:44 a.m.	(62_{25})	34 3.5	119 11.0	10	15.58	2697	2564	2476	33.57
4296	9:47 a.m.	(62_{25})	34 3.5	119 11.0	7	16.34	2699	2565	2460	33.58
4297	9:49 a.m.	(62_{25})	34 3.5	119 11.0	5	16.39	2698	2565	2458	33.58
4298	9:50 a.m.	(62_{25})	34 3.5	119 11.0	0	16.6	2700	2566	2455	33.60
4299	9:58 a.m.	(62_{25})	34 3.2	119 12.4	0	16.75	2701	2567	2453	33.61
4300	10:05 a.m.	63_{25}	34 2.8	119 13.0	0	16.9	2702	2568	2450	33.62
4301	10:15 a.m.	63_{25}	From 10:05 to 11:47 a.m. the boat drifted from the above position to the following position		300	8.10	2752	2616	2668	34.25
4302	10:34 a.m.	63_{25}			200	8.67	2741	2605	2650	34.11
4303	10:43 a.m.	63_{25}			150	8.82	2735	2600	2642	34.04
4304	10:48 a.m.	63_{25}			125	9.11	2726	2591	2628	33.93
4305	10:54 a.m.	63_{25}			100	9.41	2720	2586	2617	33.86
4306	11:00 a.m.	63_{25}			75	10.11	2701	2567	2587	33.61
4307	11:05 a.m.	63_{25}			60	10.42	2700	2566	2581	33.60
4308	11:10 a.m.	63_{25}			50	10.62	2694	2561	2572	33.53
4309	11:13 a.m.	63_{25}			40	10.97	2693	2560	2564	33.51
4310	11:16 a.m.	63_{25}			30	11.72	2694	2561	2554	33.53
4311	11:20 a.m.	63_{25}			25	12.10	2694	2561	2544	33.53
4312	11:24 a.m.	(62.5_{25})			20	13.25	2694	2561	2522	33.53
4313	11:27 a.m.	(62_{25})			17	13.63	2694	2561	2514	33.53
4314	11:32 a.m.	62_{24}			15	13.68	2693	2560	2512	33.51
4315	11:36 a.m.	62_{24}			12	14.47	2702	2568	2505	33.62
4316	11:37 a.m.	62_{24}			0	16.9	2704	2571	2452	33.66
4317	11:40 a.m.	62_{24}			10	14.93	.....	.... ..	.....	.....

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position		Depth in meters	Temperature in centigrade	Specific gravity			Salinity S ‰
			North latitude	West longitude			0° S—/4°0	17°5 S—/17°5	t° S—/4°0	
			August 7, 1913							
4318	11:42 a.m.	62_{24}			7	15.18	2704	2571	2492	33.66
4319	11:45 a.m.	62_{24}	34° 1.5	119° 10.3	5	16.33	2705	2572	2466	33.67
4320	11:55 a.m.	62_{24}	34 1.4	119 11.7	0	17.3	2703	2569	2442	33.64
4321	12:03 p.m.	63_{24}	34 1.4	119 13.2	0	17.1	2707	2573	2451	33.69
4322	12:11 p.m.	63_{24}	34 1.3	119 14.7	0	17.0	2700	2566	2446	33.60
4323	12:19 p.m.	63_{24}	34 1.2	119 16.0	0	17.35	2705	2572	2443	33.67
4324	12:27 p.m.	63_{24}	34 1.1	119 17.4	0	17.45	2700	2566	2435	33.60
4325	12:35 p.m.	64_{24}	34 1.1	119 18.9	0	17.5	2702	2568	2436	33.62
4326	12:43 p.m.	64_{24}	34 1.0	119 20.3	0	17.2	2707	2573	2448	33.69
4327	1:15 p.m.	64_{24}	33 58.4	119 19.5	0	17.55	.....	.....	.....	.....
4328	1:17 p.m.	64_{24}	33 58.4	119 19.5	300	8.05	2755	2619	2687	34.29
4329	1:28 p.m.	64_{24}	33 58.4	119 19.5	200	8.26	2746	2610	2660	34.17
4330	1:38 p.m.	64_{24}	33 58.4	119 19.5	150	8.66	2733	2598	2642	34.01
4331	1:42 p.m.	64_{24}	33 58.4	119 19.5	100	9.50	2721	2587	2617	33.87
4332	1:48 p.m.	64_{24}	33 58.4	119 19.5	75	10.01	2701	2567	2589	33.61
4333	1:54 p.m.	64_{24}	33 58.4	119 19.5	60	10.41	2698	2565	2579	33.58
4334	1:58 p.m.	64_{24}	33 58.4	119 19.5	50	11.09	2695	2562	2564	33.54
4335	2:02 p.m.	64_{24}	33 58.4	119 19.5	40	11.90	2701	2567	2555	33.61
4336	2:06 p.m.	64_{24}	33 58.4	119 19.5	30	12.66	2696	2562	2535	33.55
4337	2:10 p.m.	64_{24}	33 58.4	119 19.5	25	14.23	2700	2566	2508	33.60
4338	2:13 p.m.	64_{24}	33 58.4	119 19.5	20	16.14	2703	2569	2469	33.64
4339	2:16 p.m.	64_{24}	33 58.4	119 19.5	17	16.41	2703	2569	2463	33.64
4340	2:21 p.m.	64_{24}	33 58.4	119 19.5	15	16.44	2706	2572	2464	33.68
4341	2:23 p.m.	64_{24}	33 58.4	119 19.5	12	16.44	2705	2572	2463	33.67
4342	2:26 p.m.	64_{24}	33 58.4	119 19.5	10	16.44	2703	2569	2462	33.64
4343	2:29 p.m.	64_{24}	33 58.4	119 19.5	7	16.49	2703	2569	2460	33.64
4344	2:31 p.m.	64_{24}	33 58.4	119 19.5	5	16.54	2704	2571	2460	33.65
4345	2:32 p.m.	64_{24}	33 58.4	119 19.5	0	17.55	2705	2572	2438	33.67
4346	4:05 p.m.	66_{23}	33 55.5	119 29.0	0	17.4	2709	2575	2445	33.71
4347	4:30 p.m.	66_{23}	33 55.5	119 29.0	0	17.4	2708	2574	2444	33.70
			August 8, 1913							
4348	5:45 a.m.	66_{23}	33 55.7	119 29.9	0	17.1	2705	2572	2449	33.67
4349	5:46 a.m.	66_{23}	From 5:45 to 6:45		300	7.70	2757	2620	2680	34.31
4350	5:50 a.m.	66_{23}	a.m. the boat		150	8.80	2737	2602	2644	34.06
4351	6:02 a.m.	66_{23}	drifted from the		100	9.37	2715	2580	2613	33.78
4352	6:07 a.m.	66_{23}	above position		75	9.98	2699	2565	2587	33.58
4353	6:12 a.m.	66_{23}	to the following		60	10.59	2695	2562	2573	33.54
4354	6:16 a.m.	66_{23}	position		50	11.21	2694	2561	2561	33.53
4355	6:20 a.m.	66_{23}			40	12.41	2694	2561	2538	33.53
4356	6:24 a.m.	66_{23}			30	14.84	2700	2566	2495	33.60
4357	6:27 a.m.	66_{23}			25	15.57	2701	2567	2481	33.61
4358	6:31 a.m.	66_{23}			20	16.19	2704	2571	2468	33.66
4359	6:35 a.m.	66_{23}			17	16.54	2703	2569	2459	33.64
4360	6:38 a.m.	66_{23}			15	16.74	2705	2572	2456	33.67
4361	6:41 a.m.	66_{23}			10	16.96	2705	2572	2452	33.67
4362	6:44 a.m.	66_{23}			5	17.04	2704	2571	2449	33.66
4363	6:45 a.m.	66_{23}	33° 55.5	119° 29.0	0	17.2	2704	2571	2445	33.66
4364	7:00 a.m.	66_{23}	33 54.1	119 28.1	0	17.5	2703	2569	2437	33.64
4365	7:15 a.m.	$65_{22.5}$	33 52.5	119 27.1	0	18.3	2704	2571	2419	33.66
4366	7:30 a.m.	65_{22}	33 50.8	119 26.0	0	17.8	2703	2569	2430	33.64
4367	7:45 a.m.	65_{22}	33 49.1	119 24.9	0	18.4	2708	2574	2420	33.70
4368	8:00 a.m.	65_{21}	33 47.4	119 23.9	0	17.1	2703	2569	2447	33.64
4369	8:15 a.m.	65_{21}	33 45.7	119 22.8	0	16.4	2705	2572	2465	33.67
4370	8:30 a.m.	64_{21}	33 44.0	119 21.7	0	16.6	2707	2573	2462	33.69
4371	8:45 a.m.	64_{20}	33 42.3	119 20.6	0	17.2	2708	2574	2449	33.70
4372	9:00 a.m.	64_{20}	33 40.6	119 19.6	0	17.6	2709	2575	2441	33.71
4373	9:15 a.m.	64_{20}	33 38.9	119 18.5	0	17.7	2710	2576	2439	33.73
4374	9:30 a.m.	63_{19}	33 37.3	119 17.4	0	17.75	2706	2572	2434	33.68
4375	9:50 a.m.	63_{19}	33 35.0	119 16.0	100	8.86	.....	.....	.....	.....
4376	9:52 a.m.	63_{19}	33 35.0	119 16.0	0	17.6	2710	2576	2442	33.73
4377	9:58 a.m.	63_{19}	33 35.0	119 16.0	75	9.31	2724	2590	2623	33.90

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position		Depth in meters	Temperature in centigrade	Specific gravity			Salinity S ‰
			North latitude	West longitude			0° S—— 4°0	17°5 S—— 17°5	t° S—— 4°0	
			August 8, 1913							
4378	10:02 a.m.	63_{19}	33 35.0	119 16.0	60	.....	2716	2582	.....	33.80
4379	10:06 a.m.	63_{19}	33 35.0	119 16.0	50	10.92	2715	2580	2588	33.78
4380	10:10 a.m.	63_{19}	33 35.0	119 16.0	40	11.67	2710	2576	2569	33.73
4381	10:15 a.m.	63_{19}	33 35.0	119 16.0	30	11.92	2709	2575	2563	33.71
4382	10:18 a.m.	63_{19}	33 35.0	119 16.0	25	12.31	.....	.....	.....	.....
4383	10:22 a.m.	63_{19}	33 35.0	119 16.0	20	13.73	2707	2573	2525	33.69
4384	10:25 a.m.	63_{19}	33 35.0	119 16.0	17	13.97	.....	.....	.....	.....
4385	10:28 a.m.	63_{19}	33 35.0	119 16.0	15	16.54	2709	2575	2465	33.71
4386	10:32 a.m.	63_{19}	33 35.0	119 16.0	10	17.04	2710	2576	2455	33.73
4387	10:35 a.m.	63_{19}	33 35.0	119 16.0	5	17.44	2711	2577	2446	33.74
4388	10:37 a.m.	63_{19}	33 35.0	119 16.0	300	7.70	2755	2619	2678	34.29
4389	10:38 a.m.	63_{19}	33 35.0	119 16.0	0	17.65	2711	2577	2442	33.74
4390	11:00 a.m.	63_{19}	33 35.2	119 15.8	0	17.9	2711	2577	2435	33.74
4391	11:15 a.m.	63_{19}	33 36.8	119 14.0	0	18.2	2704	2571	2421	33.66
4392	11:30 a.m.	62_{20}	33 38.5	119 12.2	0	17.7	.....	.....	.....	.....
4393	11:45 a.m.	62_{20}	33 40.1	119 10.5	0	17.8	2701	2567	2428	33.61
4394	12:01 p.m.	62_{20}	33 41.7	119 8.7	0	17.8	2704	2571	2431	33.66
4395	12:15 p.m.	61_{21}	33 43.4	119 6.9	0	17.75	2709	2575	2437	33.71
4396	12:30 p.m.	61_{21}	33 45.0	119 5.2	0	18.1	2707	2573	2427	33.69
4397	12:45 p.m.	61_{21}	33 46.6	119 3.4	0	18.7	2706	2572	2411	33.68
4398	1:00 p.m.	60_{22}	33 48.2	119 1.6	0	18.9	2702	2568	2402	33.62
4399	1:15 p.m.	60_{22}	33 49.8	118 59.8	0	19.35	2707	2573	2395	33.69
4400	1:30 p.m.	60_{22}	33 51.7	118 57.7	0	19.4	2707	2573	2394	33.69
4401	1:33 p.m.	59.5_{22}	33 52.0	118 57.5	300	7.79	2752	2616	2674	34.25
4402	1:46 p.m.	59_{22}	From 1:33 to 2:48		100	9.85	2698	2565	2589	33.78
4403	1:55 p.m.	59_{22}	p.m. the boat		75	10.35	2691	2558	2573	33.49
4404	2:00 p.m.	59_{22}	drifted from the		60	11.11	2685	2552	2555	33.41
4405	2:01 p.m.	59_{22}	above position		0	19.4	2705	2572	2392	33.67
4406	2:03 p.m.	59_{22}	to the following		50	11.79	2684	2551	2540	33.40
4407	2:07 p.m.	59_{22}	position		35	12.80	2688	2555	2524	33.46
4408	2:11 p.m.	59_{22}			30	13.37	2685	2552	2511	33.41
4409	2:15 p.m.	59_{22}			25	13.87	.....	.....	.....	.....
4410	2:18 p.m.	59_{22}			17	15.93	2691	2558	2462	33.49
4411	2:22 p.m.	59_{22}			20	14.42	.....	.....	.....	.....
4412	2:26 p.m.	59_{22}			15	17.54	2698	2565	2431	33.58
4413	2:29 p.m.	59_{22}			12	18.52	2701	2567	2411	33.61
4414	2:32 p.m.	59_{22}			10	18.84	2700	2566	2401	33.60
4415	2:35 p.m.	59_{22}			7	19.09	2699	2565	2394	33.58
4416	2:38 p.m.	59_{22}			5	19.29	2700	2566	2389	33.60
4417	2:44 p.m.	59_{22}	33° 50.0	118° 55.0	150	9.19	2718	2583	2619	33.82
4418	3:00 p.m.	59_{22}	33 51.0	118 53.4	0	19.5	2702	2568	2386	33.62
4419	3:14 p.m.	58_{23}	33 52.7	118 51.6	0	19.9	2704	2571	2378	33.66
4420	3:30 p.m.	58_{23}	33 54.4	118 49.6	0	19.8	2709	2575	2385	33.71
4421	3:50 p.m.	57_{24}	33 56.5	118 47.0	0	18.9	2712	2578	2412	33.75
4422	4:20 p.m.	(57_{24})	33 59.4	118 46.6	0	17.15	2703	2569	2446	33.64
4423	4:35 p.m.	(57_{24})	34 0.8	118 46.4	0	16.8	2691	2558	2441	33.49
4424	7:00 p.m.	(57_{24})	34 0.8	118 46.4	0	15.8	2700	2566	2494	33.60
			August 9, 1913							
4425	5:16 a.m.	(58_{24})	33 59.5	118 52.0	0	15.3	2694	2561	2479	33.53
4426	5:25 a.m.	$59_{(24)}$	34 0.0	118 52.8	12	13.68	2696	2562	2515	33.55
4427	5:27 a.m.	$59_{(24)}$	34 0.0	118 52.8	10	14.03	2697	2564	2509	33.57
4428	5:28 a.m.	$59_{(24)}$	34 0.0	118 52.8	0	15.4	2695	2562	2499	33.54
4429	5:30 a.m.	$59_{(24)}$	34 0.0	118 52.8	7	14.59	.....	.....	.....	.....
4430	5:32 a.m.	$59_{(24)}$	34 0.0	118 52.8	5	15.04	.....	.....	.....	.....
4431	5:44 a.m.	(58_{24})	33 59.0	118 49.5	100	9.56	2710	2576	2606	33.73
4432	5:49 a.m.	(58_{24})	33 59.0	118 49.5	75	9.92	2702	2568	2592	33.62
4433	5:50 a.m.	(58_{24})	33 59.0	118 49.5	0	15.75	.....	.....	.....	.....
4434	5:55 a.m.	(58_{24})	33 59.0	118 49.5	60	10.10	2698	2565	2584	33.58
4435	6:12 a.m.	(58_{24})	33 59.0	118 49.5	50	10.42	.....	.....	.....	.....
4436	6:15 a.m.	(58_{24})	33 59.0	118 49.5	40	11.02	2695	2562	2566	33.54
4437	6:20 a.m.	(58_{24})	33 59.0	118 49.5	32	12.28	2694	2561	2540	33.53

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° S — 4°0	Specific gravity: 17°5 S — 17°5	Specific gravity: t° S — 4°0	Salinity S ‰
			August 9, 1913							
4438	6:25 a.m.	(58_{24})	33 59.0	118 49.5	25	12.53	2694	2561	2535	33.53
4439	6:30 a.m.	(58_{24})	33 59.0	118 49.5	20	12.88	2696	2562	2530	33.55
4440	6:33 a.m.	(58_{24})	33 59.0	118 49.5	17	12.93	2696	2562	2529	33.55
4441	6:36 a.m.	(58_{24})	33 59.0	118 49.5	15	13.23	2698	2565	2526	33.58
4442	6:39 a.m.	(58_{24})	33 59.0	118 49.5	12	13.53	2698	2565	2520	33.58
4443	6:43 a.m.	(58_{24})	33 59.0	118 49.5	10	14.19	2696	2562	2505	33.55
4444	6:46 a.m.	(58_{24})	33 59.0	118 49.5	7	14.74	2695	2562	2492	33.54
4445	6:48 a.m.	(58_{24})	33 59.0	118 49.5	5	14.94	2696	2562	2489	33.55
4446	6:50 a.m.	(58_{24})	33 59.0	118 49.5	0	15.75	2696	2562	2472	33.55
4447	7:10 a.m.	(58_{24})	33 57.7	118 51.0	300	8.46	2755	2619	2666	34.29
4448	7:13 a.m.	(58_{24})	33 57.7	118 51.0	0	17.2	2701	2567	2442	33.61
4449	7:22 a.m.	(58_{24})	33 57.7	118 51.0	200	8.91	.....	.....	.....	.....
4450	7:33 a.m.	(58_{24})	33 57.7	118 51.0	150	9.21	2725	2590	2626	33.91
4451	7:35 a.m.	(58_{24})	33 57.7	118 51.0	0	17.2	2703	2569	2444	33.64
4452	7:40 a.m.	(58_{24})	33 57.7	118 51.0	125	9.29	2716	2582	2615	33.80
4453	7:46 a.m.	(58_{24})	33 57.7	118 51.0	100	9.72	2709	2575	2602	33.71
4454	7:50 a.m.	(58_{24})	33 57.7	118 51.0	75	10.21	2703	2569	2588	33.64
4455	7:55 a.m.	(58_{24})	33 57.7	118 51.0	60	10.66	2694	2561	2571	33.53
4456	8:00 a.m.	(58_{24})	33 57.7	118 51.0	50	11.27	2693	2560	2559	33.51
4457	8:04 a.m.	(58_{24})	33 57.7	118 51.0	40	12.37	.....	.....	.....	.....
4458	8:07 a.m.	(58_{24})	33 57.7	118 51.0	30	13.32	2694	2561	2521	33.53
4459	8:10 a.m.	(58_{24})	33 57.7	118 51.0	25	14.01	2696	2562	2509	33.55
4460	8:13 a.m.	(58_{24})	33 57.7	118 51.0	20	15.13	2697	2564	2486	33.57
4461	8:16 a.m.	(58_{24})	33 57.7	118 51.0	17	15.49	2699	2565	2480	33.58
4462	8:20 a.m.	(58_{24})	33 57.7	118 51.0	15	15.94	2699	2565	2470	33.58
4463	8:23 a.m.	(58_{24})	33 57.7	118 51.0	12	16.39	2699	2565	2459	33.58
4464	8:26 a.m.	(58_{24})	33 57.7	118 51.0	10	16.54	2701	2567	2457	33.61
4465	8:29 a.m.	(58_{24})	33 57.7	118 51.0	7	16.69	2700	2566	2453	33.60
4466	8:50 a.m.	58_{23}	33 56.5	118 52.0	300	8.25	2752	2616	2666	34.25
4467	8:54 a.m.	58_{23}	33 56.5	118 52.0	0	18.5	2708	2574	2418	33.70
4468	9:03 a.m.	58_{23}	33 56.5	118 52.0	200	8.86	2739	2604	2645	34.09
4469	9:11 a.m.	58_{23}	33 56.5	118 52.0	150	9.31	2726	2591	2625	33.93
4470	9:17 a.m.	58_{23}	33 56.5	118 52.0	125	9.36	.....	.....	.....	.....
4471	9:25 a.m.	58_{23}	33 56.5	118 52.0	100	9.61	2709	2575	2604	33.71
4472	9:32 a.m.	58_{23}	33 56.5	118 52.0	75	9.96	2697	2564	2586	33.57
4473	9:34 a.m.	58_{23}	33 56.5	118 52.0	0	18.4	2705	2572	2417	33.67
4474	9:37 a.m.	58_{23}	33 56.5	118 52.0	60	10.43	2691	2558	2571	33.49
4475	9:42 a.m.	58_{23}	33 56.5	118 52.0	50	11.11	2693	2560	2562	33.51
4476	9:46 a.m.	58_{23}	33 56.5	118 52.0	40	11.61	2693	2560	2553	33.51
4477	9:50 a.m.	58_{23}	33 56.5	118 52.0	30	12.12	2692	2559	2542	33.50
4478	9:54 a.m.	58_{23}	33 56.5	118 52.0	25	12.56	2692	2559	2533	33.50
4479	9:57 a.m.	58_{23}	33 56.5	118 52.0	20	13.63	2694	2561	2514	33.53
4480	10:01 a.m.	58_{23}	33 56.5	118 52.0	17	14.43	2697	2564	2500	33.57
4481	10:04 a.m.	58_{23}	33 56.5	118 52.0	15	15.13	2697	2564	2486	33.57
4482	10:07 a.m.	58_{23}	33 56.5	118 52.0	12	15.53	2695	2562	2475	33.54
4483	10:10 a.m.	58_{23}	33 56.5	118 52.0	10	16.13	2698	2565	2464	33.58
4484	10:12 a.m.	58_{23}	33 56.5	118 52.0	7	17.69	2703	2569	2432	33.64
4485	10:15 a.m.	58_{23}	33 56.5	118 52.0	5	17.84	2702	2568	2428	33.62
4486	10:30 a.m.	58_{21}	33 55.6	118 50.0	0	18.1	2707	2573	2427	33.69
4487	10:45 a.m.	58_{21}	33 54.5	118 47.7	0	17.6	2703	2569	2435	33.64
4488	11:00 a.m.	57_{22}	33 53.4	118 45.3	0	16.9	2701	2567	2449	33.61
4489	11:15 a.m.	57_{22}	33 52.3	118 43.0	0	16.9	2705	2572	2452	33.67
4490	11:30 a.m.	56_{22}	33 51.2	118 40.7	0	17.2	2702	2568	2443	33.62
4491	11:45 a.m.	56_{22}	33 50.1	118 38.4	0	17.6	2706	2572	2438	33.68
4492	12:01 p.m.	55_{22}	33 49.0	118 36.0	0	17.8	2706	2572	2434	33.68
4493	12:15 p.m.	55_{22}	33 47.9	118 33.7	0	17.9	.....	.....	.....	.....
4494	12:30 p.m.	54_{21}	33 46.8	118 31.4	0	17.6	2700	2566	2432	33.60
4495	12:45 p.m.	54_{21}	33 45.7	118 29.1	0	17.7	2694	2561	2423	33.53
4496	1:02 p.m.	(53_{21})	33 44.5	118 26.4	0	17.4	2699	2565	2435	33.58
4497	1:15 p.m.	(53_{21})	33 43.6	118 24.4	0	16.0	2693	2560	2462	33.51
4498	1:30 p.m.	(53_{21})	33 44.0	118 22.9	0	17.1	2698	2565	2442	33.58

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position		Depth in meters	Temperature in centigrade	Specific gravity			Salinity $S^0/_{00}$
			North latitude	West longitude			0° S—— 4°0	17°5 S—— 17°5	1° S—— 4°0	
			August 9, 1913							
4499	1:45 p.m.	(52_{21})	33 45.3	118 21.3	0	17.1	2689	2556	2433	33.47
4500	2:00 p.m.	(52_{21})	33 42.7	118 19.6	0	16.9	2690	2557	2438	33.48
4501	2:33 p.m.	52_{20}	33 41.9	118 17.7	0	17.6	2694	2561	2426	33.53
4502	2:43 p.m.	51_{20}	33 41.9	118 15.6	0	17.45	2694	2561	2429	33.53
4503	2:51 p.m.	51_{20}	33 42.0	118 14.0	0	17.05	2691	2558	2436	33.49
			August 10, 1913							
4504	5:47 a.m.	51_{20}	33 42.0	118 14.0	0	16.6	2694	2561	2449	33.53
4505	6:03 a.m.	51_{20}	33 41.9	118 17.2	0	16.2	2692	2559	2456	33.50
4506	6:15 a.m.	(52_{21})	33 42.7	118 19.5	0	16.3	2696	2562	2458	33.55
4507	6:30 a.m.	(52_{21})	33 43.5	118 21.2	0	16.3	2694	2561	2456	33.53
4508	6:45 a.m.	(53_{21})	33 43.8	118 23.0	0	16.0	2694	2561	2463	33.53
4509	6:53 a.m.	(53_{21})	33 43.8	118 24.6	0	16.2	2699	2565	2463	33.58
4510	7:00 a.m.	(53_{21})	33 45.0	118 25.0	0	15.9	2698	2565	2470	33.58
4511	7:27 a.m.	(53_{21})	33 45.0	118 25.0	0	15.9	2697	2564	2469	33.57
4512	7:30 a.m.	(53_{21})	33 45.0	118 25.0	15	12.90	2697	2564	2531	33.57
4513	7:33 a.m.	(53_{21})	33 45.0	118 25.0	12	13.41	2699	2565	2524	33.58
4514	7:36 a.m.	(53_{21})	33 45.0	118 25.0	10	13.73	2697	2564	2515	33.57
4515	7:39 a.m.	(53_{21})	33 45.0	118 25.0	7	14.43	2696	2562	2499	33.55
4516	7:42 a.m.	(53_{21})	33 45.0	118 25.0	5	14.54	2697	2564	2498	33.57
4517	7:45 a.m.	(53_{21})	33 45.0	118 25.0	0	15.8	2696	2562	2470	33.55
4518	7:54 a.m.	(53_{21})	33 44.5	118 26.2	100	9.63	2715	2580	2609	33.78
4519	7:55 a.m.	(53_{21})	33 44.5	118 26.2	0	16.7	2703	2569	2456	33.64
4520	8:02 a.m.	(53_{21})	33 44.5	118 26.2	75	9.85	2706	2572	2597	33.68
4521	8:07 a.m.	(53_{21})	33 44.5	118 26.2	60	10.21	2700	2566	2585	33.60
4522	8:11 a.m.	(53_{21})	33 44.5	118 26.2	50	10.58	2700	2566	2578	33.60
4523	8:15 a.m.	(53_{21})	33 44.5	118 26.2	40	11.02	2694	2561	2566	33.53
4524	8:18 a.m.	(53_{21})	33 44.5	118 26.2	30	12.01	2693	2560	2545	33.51
4525	8:22 a.m.	(53_{21})	33 44.5	118 26.2	25	12.20	2691	2558	2539	33.49
4526	8:26 a.m.	(53_{21})	33 44.5	118 26.2	20	12.43	2692	2559	2536	33.50
4527	8:30 a.m.	(53_{21})	33 44.5	118 26.2	17	13.13	2692	2559	2522	33.50
4528	8:33 a.m.	(53_{21})	33 44.5	118 26.2	15	13.43	2692	2559	2516	33.50
4529	8:36 a.m.	(53_{21})	33 44.5	118 26.2	12	13.63	2692	2559	2512	33.50
4530	8:39 a.m.	(53_{21})	33 44.5	118 26.2	10	13.78	2684	2551	2502	33.40
4531	8:43 a.m.	(53_{21})	33 44.5	118 26.2	7	14.08	2681	2549	2493	33.37
4532	8:45 a.m.	(52_{21})	33 44.5	118 26.2	5	14.94	2698	2565	2491	33.58
4533	8:46 a.m.	(53_{21})	33 44.5	118 26.2	0	16.8	2702	2568	2452	33.62
4534	8:52 a.m.	(53_{21})	33 44.5	118 27.0	300	8.31	2755	2619	2668	34.29
4535	9:03 a.m.	(53_{21})	33 44.5	118 27.0	100	9.62	2713	2579	2608	33.77
4536	9:09 a.m.	(53_{21})	33 44.5	118 27.0	75	9.91	2705	2572	2595	33.67
4537	9:14 a.m.	(53_{21})	33 44.5	118 27.0	60	10.51	2697	2564	2577	33.57
4538	9:20 a.m.	(53_{21})	33 44.5	118 27.0	50	10.84	2696	2562	2570	33.55
4539	9:24 a.m.	(53_{21})	33 44.5	118 27.0	40	11.32	2694	2561	2559	33.53
4540	9:26 a.m.	(53_{21})	33 44.5	118 27.0	0	16.4	2698	2565	2458	33.58
4541	9:27 a.m.	(53_{21})	33 44.5	118 27.0	30	11.62	2693	2560	2553	33.51
4542	9:32 a.m.	(53_{21})	33 44.5	118 27.0	25	12.04	2692	2559	2543	33.50
4543	9:35 a.m.	(53_{21})	33 44.5	118 27.0	20	12.52	2696	2562	2538	33.55
4544	9:38 a.m.	(53_{21})	33 44.5	118 27.0	17	12.93	2694	2561	2527	33.53
4545	9:42 a.m.	(53_{21})	33 44.5	118 27.0	15	13.63	2694	2561	2514	33.53
4546	9:46 a.m.	(53_{21})	33 44.5	118 27.0	12	13.74	2692	2559	2510	33.50
4547	9:49 a.m.	(53_{21})	33 44.5	118 27.0	10	14.18	2694	2561	2503	33.53
4548	9:52 a.m.	(53_{21})	33 44.5	118 27.0	7	14.83	2699	2565	2494	33.58
4549	9:54 a.m.	(53_{21})	33 44.5	118 27.0	5	15.39	2698	2565	2481	33.58
4550	9:56 a.m.	(53_{21})	33 44.5	118 27.0	0	16.35	2700	2566	2461	33.60
4551	10:15 a.m.	53_{20}	33 41.9	118 26.4	0	16.8	.....	.....	.....	.....
4552	10:30 a.m.	53_{20}	33 39.8	118 26.0	0	17.55	2697	2564	2430	33.57
4553	10:45 a.m.	53_{20}	33 37.7	118 25.6	0	17.75	.....	.....	.....	.....
4554	11:00 a.m.	53_{19}	33 35.7	118 25.2	0	17.8	.....	.....	.....	.....
4555	11:05 a.m.	53_{19}	33 35.0	118 25.0	200	9.01	2740	2605	2643	34.10
4556	11:13 a.m.	53_{19}	"	"	150	9.26	2723	2589	2623	33.89
4557	11:18 a.m.	53_{19}	"	"	125	9.36	2723	2589	2621	33.89
4558	11:20 a.m.	53_{19}	"	"	0	17.8	.....	.....	.....	.....

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° S — 4°0	Specific gravity: 17°5 S — 17°5	Specific gravity: t° S — 4°0	Salinity S ‰
				August 10, 1913						
4559	11:30 a.m.	53_{19}	From 11:05 a.m. to		100	9.56	2714	2580	2610	33.78
4560	11:36 a.m.	52_{19}	12:30 p.m. the		75	9.72	2705	2572	2598	33.67
4561	11:42 a.m.	52_{19}	boat drifted from		60	9.92	2702	2568	2592	33.62
4562	11:46 a.m.	52_{19}	the above position		50	10.31	2694	2561	2577	33.53
4563	11:50 a.m.	52_{19}	to the following		40	11.06	2691	2558	2561	33.49
4564	11:54 a.m.	52_{19}	position		30	11.62	2692	2559	2552	33.50
4565	11:58 a.m.	52_{19}			25	12.04	2689	2556	2540	33.47
4566	12:02 p.m.	52_{19}			20	13.22	2691	2558	2520	33.49
4567	12:05 p.m.	52_{19}			17	13.42	2692	2559	2517	33.50
4568	12:08 p.m.	52_{19}			15	14.02	2691	2558	2504	33.49
4569	12:12 p.m.	52_{19}			12	15.13	2693	2560	2482	33.51
4570	12:14 p.m.	52_{19}			10	15.38	2697	2564	2480	33.57
4571	12:16 p.m.	52_{19}			7	16.69	2695	2562	2448	33.54
4572	12:18 p.m.	52_{19}			5	17.19	2695	2562	2436	33.54
4573	12:19 p.m.	52_{19}	33° 33!0	118° 18!0	0	18.0	2695	2562	2417	33.54
4574	12:45 p.m.	52_{18}	33 30.0	118 18.3	0	19.8	2705	2572	2381	33.67
				August 11, 1913						
4575	12:20 a.m.	52_{16}	33 20.6	18 18.8	0	19.7	2709	2575	2388	33.71
4576	12:30 a.m.	51_{16}	33 20.1	18 17.4	0	19.5	2705	2572	2389	33.67
4577	12:40 a.m.	51_{16}	33 19.5	118 15.8	0	19.35	2705	2572	2393	33.67
4578	1:00 a.m.	51_{16}	33 18.4	118 13.2	0	18.4	2699	2565	2411	33.58
4579	1:20 a.m.	50_{15}	33 17.3	118 10.4	0	18.2	2700	2566	2417	33.60
4580	1:40 a.m.	50_{15}	33 16.2	118 7.6	0	18.4	2700	2566	2412	33.60
4581	2:00 a.m.	49_{15}	33 15.0	118 4.7	0	18.6	2700	2566	2407	33.60
4582	2:20 a.m.	48_{15}	33 13.9	118 1.9	0	18.8	2701	2567	2403	33.61
4583	2:40 a.m.	48_{15}	33 12.8	117 59.1	0	19.4	2706	2572	2393	33.68
4584	3:00 a.m.	47_{14}	33 11.6	117 56.3	0	20.0	2702	2568	2373	33.62
4585	3:20 a.m.	47_{14}	33 10.5	117 53.5	0	20.0	2704	2571	2373	33.66
4586	3:40 a.m.	46_{14}	33 9.4	117 50.7	0	19.5	2705	2572	2389	33.67
4587	4:00 a.m.	46_{14}	33 8.3	117 47.9	0	19.0	2713	2579	2410	33.77
4588	4:20 a.m.	45_{13}	33 7.2	117 45.0	0	18.7	.....	.....	.....	.....
4589	4:40 a.m.	44_{13}	33 6.1	117 42.2	0	19.0	2703	2569	2400	33.64
4590	5:00 a.m.	44_{13}	33 4.9	117 39.4	0	19.2	2704	2571	2396	33.66
4591	5:20 a.m.	43_{13}	33 3.8	117 36.6	0	19.0	2703	2569	2400	33.64
4592	5:40 a.m.	43_{13}	33 2.6	117 33.8	0	18.8	2699	2565	2401	33.58
4593	6:00 a.m.	42_{12}	33 1.5	117 30.8	0	19.25	2702	2568	2393	33.62
4594	6:20 a.m.	42_{12}	33 0.4	117 28.2	0	19.0	2704	2571	2401	33.66
4595	6:40 a.m.	41_{12}	32 59.3	117 26.3	0	18.9	2702	2568	2402	33.62
4596	7:20 a.m.	40_{11}	32 57.0	117 20.2	0	17.6	2700	2566	2432	33.60
4597	7:40 a.m.	40_{11}	32 55.8	117 17.9	0	19.4	2702	2568	2389	33.62
4598	8:20 a.m.	(39_{11})	32 54.0	117 16.8	0	18.8	2703	2569	2405	33.64
				August 24, 1913						
4599	10:00 a.m.	$(39_{10.5})$	32 52.5	117 15.3	0	15.9	2693	2560	2465	33.51
				August 25, 1913						
4600	2:40 p.m.	(39_{10})	32 51.1	117 16.3	0	21.25	2695	2562	2333	33.54
4601	2:50 p.m.	(39_{10})	32 51.5	117 16.5	0	21.1	2695	2562	2336	33.54
4602	3:25 p.m.	(39_{10})	32 51.6	117 17.0	3	18.5	2694	2561	2404	33.53
4603	3:26 p.m.	(39_{10})	32 51.6	117 17.0	0	19.7	2694	2561	2373	33.53
4604	3:45 p.m.	(39_{10})	32 51.5	117 16.8	0	20.1	2694	2561	2362	33.53
4605	3:50 p.m.	(39_{10})	32 51.8	117 16.8	0	19.9	2694	2561	2368	33.53
4606	4:15 p.m.	(39_{10})	32 51.6	117 16.8	0	20.25	2696	2562	2361	33.55
4607	5:00 p.m.	(39_{10})	32 51.3	117 15.8	0	17.3	2693	2560	2432	33.51
				August 26, 1913						
4608	10:00 a.m.	$(39_{10.5})$	32 52.5	117 15.3	0	18.5	2693	2560	2403	33.51
				September 12, 1913						
4609	3:15 p.m.	40_4	32 22.4	117 21.2	1	21.1	2698	2565	2339	33.58
4610	3:30 p.m.	40_4	32 22.1	117 21.0	0	21.1	2699	2565	2340	33.58
4611	3:35 p.m.	40_4	32 22.0	117 20.9	5	21.15	2697	2564	2337	33.57
4612	4:00 p.m.	40_4	32 21.5	117 20.5	0	21.15	2703	2569	2343	33.64
4613	4:30 p.m.	40_4	32 20.5	117 19.7	0	21.0	2702	2568	2346	33.62
4614	5:42 p.m.	40_4	32 22.4	117 21.2	0	20.9	2706	2572	2353	33.68
4615	6:03 p.m.	40_4	32 21.9	117 20.8	0	29.8	2703	2569	2352	33.64

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position		Depth in meters	Temperature in centigrade	Specific gravity			Salinity $S^0/_{00}$
			North latitude	West longitude			0° $S\frac{\quad}{4°0}$	17°5 $S\frac{\quad}{17°5}$	1 $S\frac{\quad}{4.0}$	
				September 12, 1913						
4616	6:30 p.m.	40_4	32 21.5	117 20.4	0	20.8	2705	2572	2354	33.67
4617	7:00 p.m.	40_4	32 21.0	117 20.0	0	20.9	.....	.....	.....	.....
4618	7:35 p.m.	40_4	32 20.4	117 19.5	0	20.8	2712	2578	2361	33.75
4619	8:55 p.m.	40_4	32 22.3	117 21.1	0	20.7	2705	2572	2357	33.67
4620	10:00 p.m.	40_4	32 21.3	117 20.2	0	20.8	2696	2562	2343	33.55
				September 13, 1913						
4621	6:20 p.m.	40_4	32 22.4	117 21.2	1	20.65	2698	2565	2352	33.58
4622	6:30 p.m.	40_4	32 22.2	117 20.9	5	20.65	.....	.....	.....	.....
4623	6:35 p.m.	40_4	32 22.2	117 20.9	0	20.7	2705	2572	2347	33.67
4624	7:00 p.m.	40_4	32 21.9	117 20.4	0	20.6	.....	.....	.....	.....
4625	7:30 p.m.	40_4	32 21.6	117 19.9	0	20.6	2708	2574	2363	33.70
				September 17, 1913						
4626	6:00 p.m.	40_4	32 22.4	117 21.2	1	21.3	2694	2561	2330	33.53
4627	6:06 p.m.	$40_{4\,5}$	32 22.5	117 21.2	5	21.05	2694	2561	2337	33.53
4628	6:30 p.m.	40_3	32 22.8	117 21.3	0	21.2	2706	2572	2345	33.68
4629	7:06 p.m.	40_2	32 23.3	117 21.3	0	21.0	2705	2572	2349	33.67
4630	7:30 p.m.	40_2	32 23.7	117 21.3	0	20.9	2706	2572	2352	33.68
4631	8:50 p.m.	40_4	32 22.4	117 21.2	0	20.9	2705	2572	2352	33.67
4632	10:15 p.m.	40_4	32 22.4	117 21.2	0	20.7	2703	2569	2355	33.64
				September 18, 1913						
4633	9:18 p.m.	40_4	32 22.4	117 21.2	1	21.2	2697	2564	2336	33.57
4634	9:24 p.m.	40_4	32 22.3	117 21.2	5	20.45	2698	2565	2357	33.58
4635	10:02 p.m.	40_4	32 22.2	117 21.3	0	21.1	2700	2566	2341	33.60
4636	10:28 p.m.	40_4	32 22.1	117 21.4	0	21.1	2702	2568	2343	33.62
4637	10:55 p.m.	40_4	32 22.0	117 21.5	0	21.2	2701	2567	2340	33.61
4638	11:27 p.m.	40_4	32 21.8	117 21.6	0	20.8	2698	2565	2346	33.58
4639	11:55 p.m.	40_4	32 21.7	117 21.6	0	21.0	2696	2562	2340	33.55
				September 19, 1913						
4640	12:45 a.m.	40_4	32 21.5	117 21.7	0	20.0	2698	2565	2369	33.58
4641	1:31 a.m.	40_4	32 21.3	117 21.9	0	21.0	2699	2565	2343	33.58
				September 20, 1913						
4642	12:15 a.m.	40_4	32 22.4	117 21.2	1	20.4	2704	2571	2364	33.66
4643	12:25 a.m.	40_4	32 22.4	117 21.3	5	20.25	2715	2580	2380	33.78
4644	12:45 a.m.	40_4	32 22.4	117 21.5	0	20.4	2704	2571	2364	33.66
4645	1:30 a.m.	40_4	32 22.4	117 22.0	0	20.1	2704	2571	2372	33.66
4646	2:00 a.m.	40_4	32 22.3	117 22.4	0	20.2	2706	2572	2372	33.68
4647	2:28 a.m.	40_4	32 22.3	117 22.5	0	19.95	2700	2566	2373	33.60
4648	3:17 a.m.	40_4	32 22.4	117 21.2	0	20.2	2708	2574	2374	33.70
4649	3:45 a.m.	40_4	32 22.1	117 20.8	0	20.1	2701	2567	2369	33.61
4650	4:13 a.m.	40_4	32 21.6	117 20.2	0	20.2	2707	2573	2373	33.69
				September 21, 1913						
4651	3:22 a.m.	40_4	32 22.4	117 21.2	1	19.4	2694	2561	2381	33.53
4652	3:26 a.m.	40_4	32 22.4	117 21.1	5	19.25	2694	2561	2384	33.53
4653	4:10 a.m.	40_4	32 22.2	117 20.7	0	19.3	2701	2567	2390	33.61
4654	4:30 a.m.	40_4	32 22.1	117 20.5	0	19.2	2709	2575	2401	33.71
4655	4:58 a.m.	40_4	32 22.0	117 20.2	0	19.0	.....	.....	.....	.....
4656	5:30 a.m.	40_4	32 21.9	117 19.8	0	19.2	2702	2568	2394	33.62
4657	6:01 a.m.	40_4	32 22.4	117 21.2	0	19.1	2701	2567	2396	33.61
4658	6:32 a.m.	40_4	32 22.2	117 21.1	0	19.2	2704	2571	2396	33.66
4659	6:59 a.m.	40_4	32 22.0	117 21.0	0	19.5	2700	2566	2384	33.60
4660	7:32 a.m.	40_4	32 21.8	117 20.9	0	19.6	2703	2569	2384	33.64
4661	8:12 a.m.	40_4	32 21.5	117 20.8	0	19.6	2701	2567	2382	33.61
4662	8:43 a.m.	40_4	32 21.2	117 20.6	0	19.6	2706	2572	2387	33.68
				September 22, 1913						
4663	6:10 a.m.	40_4	32 22.4	117 21.2	1	19.0	2693	2560	2390	33.51
4664	6:15 a.m.	$40_{4\,5}$	32 22.5	117 21.1	5	18.65	2694	2561	2400	33.53
4665	6:30 a.m.	40_3	32 22.6	117 21.4	0	18.8	2702	2568	2404	33.62
4666	7:00 a.m.	40_2	32 22.8	117 21.6	0	18.8	2697	2564	2399	33.57
4667	7:30 a.m.	40_2	32 23.0	117 20.4	0	18.9	2702	2568	2402	33.62
4668	7:57 a.m.	40_4	32 23.2	117 20.2	0	18.9	2701	2567	2401	33.61
4669	8:45 a.m.	40_2	32 23.2	117 20.4	0	19.0	2703	2569	2400	33.64
4670	9:28 a.m.	40_2	32 23.3	117 20.0	0	18.95	2704	2571	2402	33.66

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° S — 4°0	Specific gravity: 17°5 S — 17°5	Specific gravity: t° S — 4°0	Salinity S ‰
			September 22, 1913							
4671	10:06 a.m.	40_4	32 22.4	117 21.2	0	19.2	2705	2572	2397	33.67
4672	10:28 a.m.	40_4	32 22.4	117 20.9	0	19.0	2700	2566	2397	33.60
4673	11:00 a.m.	40_4	32 22.3	117 20.4	0	19.0	2703	2569	2400	33.64
			September 23, 1913							
4674	9:16 a.m.	40_5	32 22.4	117 21.2	1	20.1	2697	2564	2365	33.57
4675	9:22 a.m.	$40_{4.5}$	32 22.5	117 21.1	5	20.15	2694	2561	2361	33.53
4676	9:32 a.m.	$40_{4.5}$	32 22.5	117 21.1	0	20.1	2705	2572	2373	33.67
4677	10:07 a.m.	40_5	32 22.7	117 20.8	0	20.2	2705	2572	2371	33.67
4678	10:37 a.m.	40_5	32 22.8	117 20.8	0	20.2	2706	2572	2372	33.68
4679	11:26 a.m.	40_5	32 23.6	117 20.6	0	20.3	.....	.....	.....	.....
			September 24, 1913							
4680	12:19 p.m.	40_4	32 22.4	117 21.2	1	20.75	2694	2561	2345	33.53
4681	12:30 p.m.	40_4	32 22.2	117 20.7	5	20.15	2697	2564	2364	33.57
4682	12:46 p.m.	40_4	32 22.1	117 20.5	0	21.0	.....	.....	.....	.....
4683	1:18 p.m.	40_4	32 22.0	117 20.1	0	20.8	2713	2579	2362	33.77
4684	1:59 p.m.	40_4	32 22.2	117 21.1	0	20.7	.....	.....	.....	.....
4685	2:30 p.m.	40_4	32 21.9	117 21.0	0	20.7	2711	2577	2363	33.74
4686	2:58 p.m.	40_4	32 21.6	117 20.9	0	20.7	2712	2578	2364	33.75
4687	3:26 p.m.	40_4	32 22.4	117 21.2	0	20.6	2700	2566	2355	33.60
4688	4:05 p.m.	40_4	32 22.0	117 20.9	0	20.5	.....	.....	.....	.....
4689	4:38 p.m.	40_4	32 21.9	117 20.9	0	20.5	2704	2571	2361	33.66
4690	5:06 p.m.	40_4	32 21.8	117 20.7	0	20.5	2707	2573	2364	33.69
			September 26, 1913							
4691	12:02 a.m.	40_4	32 20	117 21	5	20.05	2699	2565	2368	33.58
4692	4:55 a.m.	40_5	32 9	117 19	1	20.1	2701	2567	2369	33.61
4693	8:28 a.m.	40_5	32 22.4	117 21.2	1	20.1	2697	2564	2365	33.57
			May 8, 1914							
4694	5:42 a.m.	40_5	32 22.7	117 19.2	0	14.95	2698	2565	2491	33.58
4695	5:56 a.m.	40_5	From 5:38 to 9:17		6	13.93	2690	2557	2504	33.48
4696	6:14 a.m.	40_5	a.m. the boat		9	12.83	2689	2557	2525	33.48
4697	6:19 a.m.	40_5	steamed from the		9	12.74	2686	2553	2523	33.42
4698	6:28 a.m.	40_5	above position		17	11.42	2686	2553	2550	33.42
4699	6:34 a.m.	40_5	to the following		17	11.27	.....	.....	.....	.....
4700	6:43 a.m.	40_5	position		17	11.63	.....	.....	.....	.....
4701	6:48 a.m.	40_5			17	11.73	2688	2555	2545	33.46
4702	6:53 a.m.	40_5			0	14.9	2691	2558	2488	33.49
4703	6:53 a.m.	40_5			44	10.14	2703	2569	2589	33.64
4704	6:58 a.m.	40_5			44	10.01	2707	2573	2595	33.69
4705	7:28 a.m.	40_5			0	14.95	2695	2562	2488	33.54
4706	7:28 a.m.	40_5			88	9.14	2738	2602	2640	34.07
4707	7:33 a.m.	40_5			88	9.19	2732	2597	2633	34.00
4708	7:45 a.m.	40_5			90	9.06	2735	2600	2638	34.04
4709	7:50 a.m.	40_5			90	9.18	2732	2597	2633	34.00
4710	8:00 a.m.	40_5			0	14.95	2690	2557	2488	33.48
4711	8:02 a.m.	40_5			128	8.95	2744	2608	2649	34.14
4712	8:07 a.m.	40_5			128	8.97	2740	2605	2644	34.10
4713	8:21 a.m.	40_5			133	8.95	2745	2609	2650	34.16
4714	8:26 a.m.	40_5			133	9.02	.....	.....	.....	.....
4715	8:38 a.m.	40_5			0	15.1	2699	2565	2489	33.58
4716	8:39 a.m.	40_5			168	8.65	2758	2622	2666	34.33
4717	8:44 a.m.	40_5			168	8.91	.....	.....	.....	.....
4718	8:57 a.m.	40_5			170	8.69	.....	.....	.....	.....
4719	9:02 a.m.	40_5			78	9.27	2724	2590	2624	33.90
4720	9:15 a.m.	40_5	32° 22.7	117° 18.9	0	15.3	2699	2565	2484	33.58
4721	10:12 a.m.	40_5	32 22.7	117 19.2	0	15.9	2697	2564	2469	33.57
4722	10:23 a.m.	40_5	32 22.7	117 19.2	8	13.03	2694	2561	2526	33.53
4723	10:34 a.m.	40_5	32 22.7	117 19.2	9	12.82	.....	.....	.....	.....
4724	10:39 a.m.	40_5	32 22.7	117 19.2	9	13.03	2686	2553	2518	33.42
4725	10:45 a.m.	40_5	32 22.7	117 19.2	16	11.82	.....	.....	.....	.....
4726	10:56 a.m.	40_5	32 22.7	117 19.2	18	11.63	.....	.....	.....	.....
4727	11:10 a.m.	40_5	32 22.7	117 19.2	44	10.17	2706	2572	2591	33.68
4728	11:20 a.m.	40_5	32 22.7	117 19.2	0	16.2	2697	2564	2461	33.57

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° S — 4°0	Specific gravity: 17.5 S — 17°5	Specific gravity: 4 S — 4°0	Salinity S ‰
				May 8, 1914						
4729	11:22 a.m.	40_2	32 22.7	117 19.2	40	10.17	2698	2565	2583	33.58
4730	11:44 a.m.	40_3	32 22.7	117 19.2	40	10.30	2696	2562	2579	33.55
4731	11:55 a.m.	40_3	32 22.7	117 19.2	0	16.3	2691	2558	2453	33.49
4732	12:50 p.m.	40_3	32 22.7	117 19.2	46	10.09	2705	2572	2591	33.67
4733	12:55 p.m.	40_3	32 22.7	117 19.2	46	10.09	2702	2568	2588	33.62
4734	1:02 p.m.	40_3	32 22.7	117 19.2	88	9.28	2728	2593	2627	33.95
4735	1:07 p.m.	40_3	32 22.7	117 19.2	88	9.26	2726	2591	2625	33.93
4736	1:09 p.m.	40_3	32 22.7	117 19.2	88	9.29	2725	2590	2624	33.91
4737	1:24 p.m.	40_3	32 22.7	117 19.2	88	9.36	...	...	...	...
4738	1:34 p.m.	40_3	32 22.7	117 19.2	124	9.12	2745	2609	2647	34.16
4739	1:39 p.m.	40_3	32 22.7	117 19.2	85	9.36	2730	2595	2628	33.97
4740	1:56 p.m.	40_3	32 22.7	117 19.2	0	16.5	2696	2562	2453	33.55
4741	6:05 p.m.	40_3	32 22.7	117 19.2	0	15.7	2695	2562	2472	33.54
4742	6:25 p.m.	40_3	From 6:05 to 9:05		9	. .	2685	2552	. .	33.41
4743	6:30 p.m.	40_3	p.m. the boat		9	.....	2690	2557	. .	33.48
4744	6:37 p.m.	40_3	steamed from the		9	.....	2686	2553	...	33.42
4745	6:50 p.m.	40_3	above position		6	13.99	2689	2556	2502	33.47
4746	6:55 p.m.	40_3	to the following		6	14.14	2688	2555	2498	33.46
4747	7:02 p.m.	40_3	position		0	15.7	2691	2558	2468	33.49
4748	7:16 p.m.	40_4			45	9.93	2705	2572	2595	33.67
4749	7:21 p.m.	40_4			45	9.87	2704	2571	2595	33.68
4750	7:35 p.m.	40_4			45	9.86	2705	2572	2596	33.67
4751	7:49 p.m.	40_4			90	9.24	2738	2602	2638	34.07
4752	7:54 p.m.	40_4			90		2741	2605	....	34.11
4753	8:09 p.m.	40_4			136	8.79	....	... ..	. .	.....
4754	8:40 p.m.	40_4			165	8.69	2749	2613	2656	34.22
4755	8:45 p.m.	40_4			95	9.38	2735	2600	2632	34.04
4756	9:00 p.m.	40_4	32° 22'1	117° 18'8	0	15.6	2696	2562	2475	33.55
				May 9, 1914						
4757	8:35 a.m.	39_5	32 23.0	117 14.3	0	15.6	2691	2558	2470	33.49
4758	8:45 a.m.	39_5	32 22.8	117 15.5	0	15.3	2692	2559	2477	33.50
4759	9:00 a.m.	39.5_4	32 22.3	117 17.5	0	15.3	2694	2561	2479	33.53
4760	9:15 a.m.	40_4	32 21.9	117 19.6	0	15.5	2689	2556	2470	33.47
4761	9:30 a.m.	40_4	32 21.5	117 21.6	0	15.8	2688	2555	2462	33.46
4762	9:46 a.m.	41_4	32 21.0	117 24.0	0	15.9	2690	2557	2462	33.48
4763	9:57 a.m.	41_4	From 9:46 a.m. to		0	15.9	2693	2560	2465	33.51
4764	10:13 a.m.	41_4	12:25 p.m. the boat		9	15.84	... ...	.	.. .	..
4765	10:18 a.m.	41_4	steamed from the		9	15.85	. .	.	....	.
4766	10:26 a.m.	41_4	above position		0	16.0	2694	2561	2463	33.53
4767	10:27 a.m.	41_4	to the following		5	15.79	2689	2556	2463	33.47
4768	10:32 a.m.	41_4	position		9	15.43	. .	. . .	.	...
4769	10:41 a.m.	41_4			17	12.42	.....	.	.....	...
4770	10:53 a.m.	41_4			18	12.22	...	.	...	.
4771	12:20 p.m.	41_4			0	16.4	2691	2558	2451	33.49
4772	12:28 p.m.	41_4	32° 21'5	117° 23'9	44	10.27	2700	2566	2584	33.60
4773	12:59 p.m.	41_4	From 12:25 to 1:20		46	10.19	2696	2562	2581	33.55
4774	1:10 p.m.	41_4	p.m. boat steamed		84	9.48	2729	2594	2625	33.96
4775	1:15 p.m.	41_4	from the above to		84	9.39	2723	2589	2620	33.89
4776	1:20 p.m.	41_4	following position		0	16.5	2695	2562	2452	33.54
4777	1:30 p.m.	41_4	32° 21'2	117° 23'3	137	9.18	.. ..	....	.....	.....
				May 10, 1914						
4778	4:33 a.m.	39_5	32 23.0	117 14.3	0	15.0	2694	2561	2486	33.53
4779	4:45 a.m.	39_5	32 22.6	117 16.1	0	15.0	2694	2561	2486	33.53
4780	5:00 a.m.	40_4	32 22.2	117 18.0	0	15.3	2689	2556	2474	33.47
4781	5:15 a.m.	40_4	32 21.8	117 20.0	0	15.0	2691	2558	2483	33.49
4782	5:30 a.m.	40_4	32 21.4	117 22.0	0	15.2	2683	2550	2471	33.39
4783	5:45 a.m.	41_4	32 21.0	117 24.0	0	15.6	2687	2554	2466	33.44
4784	5:55 a.m.	41_4	32 21.0	117 24.0	0	15.6	2688	2555	2467	33.46
4785	6:06 a.m.	41_4	32 21.0	117 24.0	9	15.23	2683	2550	2470	33.39
4786	6:11 a.m.	41_4	32 21.0	117 24.0	9	15.09	2686	2553	2476	33.42
4787	6:17 a.m.	41_4	32 21.0	117 24.0	9	15.04	2685	2552	2476	33.41

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° S—— 4°0	Specific gravity: 17°5 S—— 17°5	Specific gravity: t° S—— 4°0	Salinity S ‰
				May 10, 1914						
4788	6:22 a.m.	41,	32 21.0	117 24.0	9	15.05	2685	2552	2476	33.41
4789	6:34 a.m.	41,	32 21.0	117 24.0	18	11.91	.....	.....	.....	.....
4790	6:39 a.m.	41,	32 21.0	117 24.0	18	11.50	2686	2553	2554	33.42
4791	6:49 a.m.	41,	32 21.0	117 24.0	18	11.83	.....	.....	.....	.....
4792	7:27 a.m.	41,	32 21.0	117 24.0	0	15.7	2692	2559	2469	33.50
4793	7:30 a.m.	41,	32 21.0	117 24.0	5	15.86	2688	2555	2461	33.46
4794	7:35 a.m.	41,	32 21.0	117 24.0	42	10.30	2694	2561	2577	33.53
4795	7:48 a.m.	41,	32 21.0	117 24.0	44	10.35	.....	.....	.....	.....
4796	8:00 a.m.	41,	32 21.0	117 24.0	88	9.65	.....	.....	.....	.....
4797	8:15 a.m.	41,	32 21.0	117 24.0	88	9.40	2726	2591	2623	33.93
4798	8:23 a.m.	41,	32 21.0	117 24.0	0	15.8	2691	2558	2465	33.49
4799	8:26 a.m.	41,	32 21.0	117 24.0	130	9.20	.....	.....	.....	.....
4800	8:55 a.m.	41,	32 21.0	117 24.0	0	15.8	2695	2562	2469	33.54
4801	9:24 a.m.	41,	32 21.0	117 24.0	175	9.19	.....	.....	.....	.....
4802	9:35 a.m.	41,	32 21.0	117 24.0	0	15.9	2690	2557	2462	33.48
4803	9:45 a.m.	41,	32 21.3	117 23.7	0	15.8	2688	2555	2462	33.46
4804	10:00 a.m.	41,	32 22.3	117 22.7	0	15.8	2689	2556	2463	33.47
4805	10:15 a.m.	40,	32 23.2	117 21.7	0	16.1	2690	2557	2457	33.48
4806	10:30 a.m.	40,	32 24.1	117 20.7	0	15.8	2691	2558	2465	33.49
4807	10:45 a.m.	40,	32 25.0	117 19.7	0	15.5	2689	2556	2470	33.47
4808	11:00 a.m.	40,	32 26.0	117 18.7	0	15.3	2697	2564	2482	33.57
4809	11:17 a.m.	40,	32 26.9	117 18.1	0	14.6	2689	2556	2489	33.47
4810	11:12 p.m.	39,	32 23.0	117 14.3	0	15.2	2695	2562	2483	33.54
4811	11:29 p.m.	39,	32 22.4	117 15.7	0	15.3	2690	2557	2475	33.48
4812	11:45 p.m.	40,	32 22.0	117 17.9	0	15.9	2687	2554	2459	33.44
4813	11:59 p.m.	40,	32 21.6	117 21.3	0	15.8	2691	2558	2465	33.49
				May 11, 1914						
4814	12:31 a.m.	41,	32 21.0	117 24.0	0	15.8	2687	2554	2461	33.44
4815	12:40 a.m.	41,	From 12:27 to 4:02		9	15.86	2685	2552	2458	33.41
4816	12:45 a.m.	41,	a.m. the boat		9	15.84	2684	2551	2457	33.40
4817	12:54 a.m.	41,	steamed from the		9	.....	2685	2552	.....	33.41
4818	12:59 a.m.	41,	above position		9	15.85	2683	2550	2456	33.39
4819	1:07 a.m.	41,	to the following		18	.....	2684	2551	.....	33.40
4820	2:25 a.m.	41,	position		46	10.50	.....	.....	.....	.....
4821	2:34 a.m.	41,			0	15.8	2688	2555	2462	33.46
4822	2:41 a.m.	41,			90	9.50	.....	.....	.....	.....
4823	2:57 a.m.	41,			135	9.08	.....	.....	.....	.....
4824	3:13 a.m.	41,			12	13.96	2684	2551	2499	33.40
4825	3:18 a.m.	41,			185	8.79	.....	.....	.....	.....
4826	3:30 a.m.	41,			0	15.8	2688	2555	2462	33.46
4827	3:39 a.m.	41,			27	.....	2685	2552	.....	33.41
4828	3:44 a.m.	41,			27	11.26	2688	2555	2554	33.46
4829	3:53 a.m.	41,			30	11.07	2690	2557	2560	33.48
4830	3:58 a.m.	41,	32° 18'5	117° 27'2	30	11.01	.....	.....	.....	.....
4831	4:07 a.m.	41,	32 18.7	117 26.6	0	15.8	2690	2557	2464	33.48
4832	4:22 a.m.	41,	32 19.4	117 24.7	0	15.7	2688	2555	2465	33.46
4833	4:37 a.m.	41,	32 20.1	117 22.6	0	15.8	2688	2555	2462	33.46
4834	4:52 a.m.	40,	32 20.9	117 20.4	0	15.9	2686	2553	2456	33.42
4835	5:07 a.m.	40,	32 21.6	117 18.4	0	15.8	2690	2557	2464	33.48
4836	5:22 a.m.	39,	32 22.3	117 16.3	0	14.2	2694	2561	2503	33.53
4837	5:37 a.m.	39,	32 23.0	117 14.2	0	14.5	2691	2558	2493	33.49
4838	11:40 p.m.	39,	32 23.0	117 14.2	0	14.7	2698	2565	2494	33.58
4839	11:59 p.m.	39,	32 22.8	117 17.2	0	16.4	2688	2555	2448	33.46
				May 12, 1914						
4840	12:12 a.m.	40,	32 22.7	117 19.2	0	16.2	2684	2551	2448	33.40
4841	12:20 a.m.	40,	From 12:12 to 4:10		0	16.2	2686	2553	2450	33.42
4842	12:30 a.m.	40,	a.m. the boat		9	15.95	2682	2550	2452	33.38
4843	12:35 a.m.	40,	steamed from the		9	16.14	2688	2555	2454	33.46
4844	12:43 a.m.	40,	above position		8	16.15	.....	.....	.....	.....
4845	12:55 a.m.	40,	to the following		17	12.74	2682	2550	2519	33.38
4846	1:00 a.m.	40,	position		17	.....	2682	2550	.....	33.38

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° S/4°0	Specific gravity: 17°5 S/17°5	Specific gravity: t° S/4°0	Salinity S ‰
				May 12, 1914						
4847	1:06 a.m.	40_5			17	12.62	2681	2549	2521	33.37
4848	1:11 a.m.	40_4			17	.....	2680	2550	.....	33.38
4849	1:19 a.m.	40_3			35	10.49	2691	2558	2570	33.49
4850	1:24 a.m.	40_3			35	10.40	.....	.....	.....	.....
4851	1:37 a.m.	40_4			45	10.14	2699	2565	2585	33.58
4852	1:50 a.m.	40_4			0	16.2	2685	2552	2449	33.41
4853	1:52 a.m.	40_4			46	10.09	.....	.....	.....	.....
4854	2:12 a.m.	40_4			86	9.28	.....	.....	.....	.....
4855	2:22 a.m.	40_4			60	10.04	2720	2586	2606	33.86
4856	2:27 a.m.	40_4			88	9.29	.....	.....	.....	.....
4857	2:44 a.m.	40_4			119	8.99	.....	.....	.....	.....
4858	3:00 a.m.	40_3			58	9.90	2718	2583	2607	33.82
4859	3:20 a.m.	40_4			172	8.59	.....	.....	.....	.....
4860	3:39 a.m.	40_4			172	8.88	.....	.....	.....	.....
4861	4:00 a.m.	40_4			0	16.0	2685	2552	2454	33.41
4862	4:04 a.m.	40_4			27	11.19	2691	2558	2558	33.49
4863	4:09 a.m.	40_4	32° 20'6	117° 20'2	27	11.16	2689	2556	2557	33.47
4864	4:38 a.m.	40_4	32 21.0	117 20.7	0	16.0	2685	2552	2454	33.41
4865	4:45 a.m.	40_4	32 20.6	117 21.7	0	16.0	2688	2555	2457	33.46
4866	5:00 a.m.	41_4	32 19.7	117 23.8	0	16.0	2687	2554	2456	33.44
4867	5:12 a.m.	41_4	32 19.1	117 25.4	0	15.8	2690	2557	2464	33.48
4868	5:30 a.m.	41_4	32 19.9	117 24.2	0	16.0	2684	2551	2453	33.40
4869	5:46 a.m.	41_4	32 21.2	117 22.6	0	16.0	2688	2555	2457	33.46
4870	6:00 a.m.	40_4	32 22.3	117 21.0	0	16.0	2686	2553	2455	33.42
4871	6:15 a.m.	40_5	32 23.6	117 19.2	0	16.5	2691	2558	2448	33.49
4872	6:26 a.m.	40_5	32 24.7	117 17.8	0	15.7	2690	2557	2467	33.48
4873	6:30 a.m.	39_5	32 25.0	117 17.4	0	15.6	2691	2558	2470	33.49
4874	6:35 a.m.	39_5	32 25.4	117 16.9	0	16.2	2686	2553	2450	33.42
4875	6:38 a.m.	39_5	32 25.8	117 16.9	0	16.1	2688	2555	2455	33.46
				June 5, 1914						
4876	11:30 a.m.	(39_{10})	32 51.9	117 15.5	0	17.7	2710	2576	2439	33.73
				June 11, 1914						
4877	4:00 p.m.	(39_{10})	32 51.9	117 15.5	0	18.9	2725	2590	2424	33.91
				June 12, 1914						
4878	4:00 p.m.	(39_{10})	32 51.9	117 15.5	0	19.0	2704	2571	2401	33.66
				June 15, 1914						
4879	11:59 a.m.	(39_{10})	32 51.9	117 15.5	0	18.5	2728	2593	2437	33.95
4880	4:00 p.m.	(39_{10})	32 51.9	117 15.5	0	19.0	2709	2575	2388	33.71
				June 19, 1914						
4881	5:00 p.m.	(39_{10})	32 51.9	117 15.5	0	20.7	2725	2590	2376	33.91
				June 22, 1914						
4882	5:00 p.m.	(39_{10})	32 51.9	117 15.5	0	20.9	2726	2591	2372	33.93
				June 30, 1914						
4883	5:15 p.m.	(39_{10})	32 51.9	117 15.5	0	21.9	2724	2589	2343	33.90
				November 29, 1914						
4884	11:00 a.m.	G	28 0	110 50	0	25.0	2827	2687	2349	35.17
4885	1:00 p.m.	G	27 50	110 50	0	23.8	2824	2684	2384	35.14
4886	5:00 p.m.	G	27 40	110 45	0	24.2	2824	2684	2372	35.14
				November 30, 1914						
4887	7:00 a.m.	G	27 30	110 45	0	24.6	2818	2678	2355	35.07
4888	2:00 p.m.	G	27 20	110 45	0	24.6	2826	2686	2363	35.16
				December 1, 1914						
4889	1:40 a.m.	G	27 2	110 20	0	23.6	.....	.....	.....	.....
				December 4, 1914						
4890	1:00 p.m.	G	27 0	110 22	0	24.2	2825	2685	2373	35.16
				December 5, 1914						
4891	6:00 a.m.	G	26 30	110 45	0	24.2	2828	2688	2376	35.19
4892	11:59 a.m.	G	26 10	111 0	0	24.4	2817	2677	2359	35.06
				December 11, 1914						
4893	4:00 p.m.	G	23 30	109 20	0	24.6	2825	2685	2362	35.16
4894	6:00 p.m.	G	23 20	109 20	0	24.8	2806	2667	2340	34.92
4895	8:00 p.m.	G	23 10	109 25	0	25.0	.....	.....	.....	.....
4896	10:00 p.m.	G	22 55	109 40	0	25.2	2786	2648	2305	34.67
4897	11:59 p.m.	G	22 45	109 50	0	25.0	2806	2667	2331	34.92

Table 1.—Ocean Data—(*Continued*)

Water sample number	Time of day	Section	Position: North latitude	Position: West longitude	Depth in meters	Temperature in centigrade	Specific gravity: 0° / 4°0	Specific gravity: 17°5 / 4°0	Specific gravity: 1° / 4°0	Salinity S‰
			December 12, 1914							
4898	2:00 a.m.	—46[111]	22 45	110 8	0	25.0	2807	2668	2332	34.93
4899	8:00 a.m.	—43[105]	23 15	110 25	0	25.1	.....	.....	.....	.....
4900	11:00 a.m.	—42[103]	23 25	110 30	0	24.8	2792	2654	2324	34.74
4901	1:00 p.m.	(—39[99])	23 45	110 45	0	24.8	2796	2658	2328	34.79
			December 13, 1914							
4902	2:00 p.m.	—27[93]	24 15	111 45	0	22.2	2781	2643	2388	34.60
4903	6:00 p.m.	—24[89]	24 35	112 0	0	21.4	2781	2643	2410	34.60
			December 14, 1914							
4904	1:00 a.m.	—21[82]	25 10	112 15	0	21.8	2764	2627	2383	34.40
4905	7:00 a.m.	(—22)[76]	25 40	112 10	0	21.5	2761	2624	2388	34.36
4906	11:59 a.m.	(—21)[75]	25 45	112 15	0	21.4	2726	2591	2358	33.93
			December 15, 1914							
4907	11:59 a.m.	3[60]	27 0	114 15	0	19.2	2730	2595	2421	33.97
			December 16, 1914							
4908	11:59 a.m.	5[59]	27 6	114 25	0	19.2	2733	2597	2424	34.01
			December 18, 1914							
4909	8:00 a.m.	10[52]	27 40	114 50	0	19.2	2731	2596	2422	33.98
4910	11:59 a.m.	12[51]	27 45	115 2	0	18.8	2730	2595	2431	33.97
4911	2:20 p.m.	15[48]	28 0	115 15	0	17.7	2702	2568	2431	33.62
4912	5:30 p.m.	15[44]	28 20	115 14	0	17.4	2697	2564	2433	33.57
			December 19, 1914							
4913	2:00 p.m.	(15[31])	29 25	115 15	0	16.2	2684	2551	2458	33.40
			December 21, 1914							
4914	9:00 a.m.	(25)[18]	30 30	116 7	0	16.6	2681	2549	2438	33.37
4915	6:30 p.m.	(32[5])	31 35	116 40	0	15.8	2688	2555	2463	33.46
			December 22, 1914							
4916	11:00 a.m.	39[5]	32 23	117 15	0	15.4	2678	2546	2462	33.33
			May 14, 1915							
4917	6:20 a.m.	40_1	32 21.0	117 19.7	0	15.6	2691	2558	2470	33.49
4918	6:35 a.m.	40_1	From 4:25 to 10:50		18	14.30	2676	2543	2484	33.30
4919	6:35 a.m.	40_1	a.m. the boat		92	9.30	.....	.....	.....	.....
4920	6:57 a.m.	40_4	drifted from the		0	15.6	2681	2549	2461	33.37
4921	7:12 a.m.	40_4	above position		18	14.22	2677	2544	2487	33.31
4922	7:12 a.m.	40_4	to the following		92	9.30	.....	.....	.....	.....
4923	7:33 a.m.	40_5	position		0	15.6	2680	2547	2460	33.35
4924	7:48 a.m.	41_4			18	14.30	2678	2546	2486	33.33
4925	7:48 a.m.	41_4			92	9.15	.....	.....	.....	.....
4926	8:10 a.m.	41_4			0	15.7	2681	2549	2459	33.37
4927	8:24 a.m.	41_4			18	14.30	2679	2546	2487	33.34
4928	8:24 a.m.	41_4			20	14.10	2679	2546	2491	33.34
4929	8:45 a.m.	41_3			0	15.85	2680	2547	2454	33.35
4930	8:58 a.m.	41_3			18	14.25	2677	2544	2486	33.31
4931	8:58 a.m.	41_3			92	9.50	2709	2575	2606	33.71
4932	9:15 a.m.	41_3			0	15.8	2681	2549	2456	33.37
4933	9:30 a.m.	41_3			18	14.45	2679	2546	2483	33.34
4934	9:30 a.m.	41_3			92	9.50	2707	2573	2604	33.69
4935	9:45 a.m.	41_3			0	15.9	2681	2549	2454	33.37
4936	10:00 a.m.	41_3			18	14.45	2675	2543	2479	33.30
4937	10:00 a.m.	41_3			24	12.20	2678	2546	2528	33.33
4938	10:16 a.m.	41_2			0	16.0	2681	2549	2452	33.37
4939	10:31 a.m.	41_1			18	13.85	.....	.....	.....	.....
4940	10:31 a.m.	41_1	32° 15′	117° 25′	92	9.85	2708	2574	2599	33.70
4941	12:25 p.m.	40_5	32 23.0	117 19.4	0	16.2	2682	2549	2448	33.38
4942	12:40 p.m.	40_4	From 12:10 to 1:30		18	14.95	2681	2549	2475	33.37
4943	12:40 p.m.	40_4	p.m. boat drifted		92	9.50	2714	2579	2611	33.77
4944	12:55 p.m.	40_5	from the above to		0	16.15	2680	2547	2447	33.35
4945	1:10 p.m.	40_4	following position		18	14.70	2676	2543	2475	33.30
4946	1:10 p.m.	40_4	32° 21′	117° 19′3	92	9.45	2717	2582	2614	33.81
			May 15, 1915							
4947	5:32 a.m.	40_1	32 22.4	117 21.2	0	16.3	2679	2546	2443	33.34
4948	5:47 a.m.	40_4	From 5:20 to 9:25		18	15.40	2676	2543	2460	33.30
4949	5:47 a.m.	40_4	a.m. the boat		92	9.40	2707	2573	2605	33.69
4950	6:08 a.m.	40_4	drifted from the		0	16.3	2680	2547	2444	33.35

TABLE 1.—OCEAN DATA—(*Continued*)

Water sample number	Time of day	Section	Position North latitude	Position West longitude	Depth in meters	Temperature in centigrade	Specific gravity 0° S/4°0	Specific gravity 17°5 S/17°5	Specific gravity 1° S/4°0	Salinity S‰
			May 15, 1914							
4951	6:23 a.m.	40,	above position		18	15.45	2674	2542	2457	33.28
4952	6:23 a.m.	40,	to the following		92	9.40	2707	2573	2605	33.69
4953	6:36 a.m.	40,	position		0	16.3	2681	2549	2445	33.37
4954	6:51 a.m.	40,			18	15.30	2677	2544	2463	33.31
4955	7:20 a.m.	40,			0	16.3	2678	2546	2442	33.33
4956	7:35 a.m.	40.			18	15.30	2676	2543	2462	33.30
4957	7:35 a.m.	40.			92	9.25	2701	2567	2602	33.61
4958	7:53 a.m.	40.			0	16.3	2681	2549	2445	33.37
4959	8:08 a.m.	40.			18	15.40	2677	2544	2461	33.31
4960	8:08 a.m.	40.			92	9.30	2703	2569	2603	33.64
4961	8:25 a.m.	40.			0	16.4	2681	2549	2443	33.37
4962	8:40 a.m.	40.			18	15.30	2674	2542	2460	33.28
4963	8:40 a.m.	40.			92	9.50	2703	2569	2600	33.64
4964	8:55 a.m.	40.			0	16.4	2678	2546	2440	33.33
4965	9:10 a.m.	40.	32° 15'0	117° 19'0	73	10.20	2695	2561	2580	33.54 ?
4966	10:37 a.m.	40.	32 23.0	117 19.1	0	16.75	2680	2547	2433	33.35
4967	10:52 a.m.	40.	From 10:30 a.m. to		18	15.25	2677	2544	2465	33.31
4968	11:07 a.m.	40,	1:15 p.m. the boat		0	16.75	2681	2549	2435	33.37
4969	11:22 a.m.	40,	drifted from the		18	15.05	2678	2546	2470	33.33
4970	11:43 a.m.	40,	above to the fol-		0	16.7	2677	2544	2542	33.31
4971	11:58 a.m.	40,	lowing position		42	11.60	2690	2557	2550	33.48
4972	11:58 a.m.	40,			92	9.40	2714	2579	2612	33.77
4973	12:35 p.m.	40,			0	16.7	2680	2547	2434	33.35
4974	12:50 p.m.	40,			18	15.35	2676	2543	2461	33.30
4975	1:08 p.m.	40,			0	16.8	2679	2546	2431	33.34
4976	1:23 p.m.	40,			18	15.00	2676	2543	2469	33.30
4977	1:23 p.m.	40,	32° 19'2	117° 18'8	92	9.40	2708	2574	2606	33.70
			May 16, 1915							
4978	5:27 a.m.	40,	32 20.0	117 20.0	0	17.1	2682	2549	2428	33.38
4979	5:42 a.m.	40,	From 5:15 to 11:45		18	15.35	2676	2543	2461	33.30
4980	5:42 a.m.	40,	a.m. the boat		92	9.65	.....	.....	.....	.....
4981	6:00 a.m.	40,	drifted from the		0	17.05	2678	2546	2425	33.33
4982	6:15 a.m.	40,	above to the fol-		18	15.55	2676	2543	2457	33.30
4983	6:15 a.m.	40,	lowing position		84	9.75	2710	2576	2603	33.73
4984	6:27 a.m.	40,			0	17.0	2678	2546	2426	33.33
4985	6:42 a.m.	40,			18	15.55	2675	2543	2456	33.30
4986	6:42 a.m.	40,			92	9.50	2720	2586	2616	33.86
4987	6:56 a.m.	40,			0	17.05	2676	2543	2423	33.30
4988	7:10 a.m.	40,			18	15.55	2676	2543	2457	33.30
4989	7:10 a.m.	40,			92	9.60	2715	2580	2610	33.78
4990	7:31 a.m.	40,			0	17.1	2679	2546	2443	33.34
4991	7:46 a.m.	40,			18	15.75	.....	.....	.....	.....
4992	7:46 a.m.	40,			92	9.70	2712	2578	2605	33.75
4993	7:59 a.m.	40,			0	17.1	2678	2546	2424	33.33
4994	8:14 a.m.	40,			18	15.75	2678	2546	2455	33.33
4995	8:14 a.m.	40,			92	.....	2719	2584	.....	33.84
4996	8:28 a.m.	40,			0	16.9	2677	2544	2427	33.31
4997	8:43 a.m.	40,			18	15.45	2675	2543	2458	33.30
4998	8:43 a.m.	40,			92	9.65	2716	2582	2610	33.80
4999	8:56 a.m.	40,			0	16.9	2678	2546	2428	33.33
5000	9:11 a.m.	40,			18	15.30	2676	2543	2462	33.30
5001	9:11 a.m.	40,			92	9.40	2720	2586	2617	33.86
5002	9:24 a.m.	40,			0	16.9	2679	2546	2428	33.34
5003	9:39 a.m.	40,			18	15.25	2677	2544	2465	33.31
5004	9:39 a.m.	40,			92	9.55	.....	.....	.....	.....
5005	9:52 a.m.	40,			0	17.0	2678	2546	2426	33.33
5006	10:07 a.m.	40,			18	15.30	2676	2543	2462	33.30
5007	10:07 a.m.	40,			92	9.60	2715	2580	2610	33.78
5008	10:17 a.m.	40,			0	16.9	2678	2546	2428	33.33
5009	10:32 a.m.	40,			18	15.30	2679	2546	2465	33.34
5010	10:32 a.m.	40,			92	9.80	2717	2582	2609	33.81

Table 1.—Ocean Data—(*Concluded*)

Water sample number	Time of day	Section	Position		Depth in meters	Temperature in centigrade	Specific gravity			Salinity S ‰
			North latitude	West longitude			0° S / 4°0	17°5 S / 17°5	t° S / 4°0	
			May 16, 1915							
5011	10:42 a.m.	40_4			0	16.9	2678	2546	2428	33.33
5012	10:57 a.m.	40_4			18	15.25	2676	2543	2463	33.30
5013	10:57 a.m.	40_4			92	9.65	2721	2586	2614	33.86
5014	11:08 a.m.	40_4			0	16.9	2677	2544	2428	33.31
5015	11:23 a.m.	04_4			18	15.35	2674	2542	2459	33.28
5016	11:23 a.m.	40_4			92	9.75	2719	2584	2611	33.84
5017	11:33 a.m.	40_4			0	16.9	2680	2547	2430	33.35
5018	11:48 a.m.	40_4			22	15.05	2678	2546	2456	33.33
5019	11:48 a.m.	40_4	32° 20.3	117° 19.0	92	9.65	2721	2586	2614	33.86

EXPLANATION OF TABLE 2

The series of surface temperature and salinity observations begun in August, 1912 (see former report, 1915, p. 119) for the purpose of determining the relation between the seasonal variation in San Diego Bay and in the ocean were continued until October, 1914. Since 1912, all the bay observations have been made in Glorietta Bight, and all the corresponding ocean observations from Coronado Pier.

First column.—Water-sample numbers entered in chronological order irrespective of position.

Second column.—Date.

Third column.— Time when the sample was collected entered to the nearest minute.

Fourth column.—Position denoted by the symbols *C.P.* and *G.B.*, the former referring to Coronado Pier—32° 40.4 N and 117° 10.7 W, and the latter to Glorietta Bight—32° 40.6 N and 117° 10.0 W.

Fifth column.—Tide; falling, rising, high, and low tides being indicated by *F*, *R*, *H*, and *L*.

Sixth column.—Temperature *in situ;* for accuracy see explanation to table 1, page 218.

Seventh, eighth, and ninth columns.—Specific gravity of the sample under atmospheric pressure, the 1.0 being omitted; see table 1, page 219, for explanation of symbols.

Tenth column.—Salinity *per mille* determined by the "sinker method" as described in our former report (1915, pp. 32–37). The reason for occasional omissions of salinity and specific gravity entries is stated in the explanation of table 1, page 219.

TABLE 2.—DATA RELATIVE TO SAN DIEGO BAY

Water sample number	Date	Time of day	Position	Tide	Temperature in centigrade	Specific gravity $S^{0°}_{4°}$	Specific gravity $S^{17.5°}_{17.5°}$	Specific gravity $S^{t°}_{4°}$	Salinity S ‰
	1913								
B 497	Jan. 11	10:00 a.m.	C.P.	H	.....	2693	2560	...	33.52
B 498	Jan. 11	10:30 a.m.	G.B.	H	.....	2748	2612	...	34.20
B 499	Jan. 14	1:00 p.m.	G.B.	H	.....	2730	2595	...	33.97
B 500	Jan. 14	1:20 p.m.	C.P.	H	12.0	2700	2567	2552	33.60
B 501	Jan. 18	3:00 p.m.	C.P.	R	13.5	2691	2558	2514	33.49
B 502	Jan. 18	3:15 p.m.	G.B.	R	...	2715	2581	.....	33.79
B 503	Feb. 9	1:00 p.m.	C.P.	F	13.0	2706	2573	2539	33.68
B 504	Feb. 9	1:20 p.m.	G.B.	F	13.8	2707	2574	2524	33.69
B 505	Feb. 23	12:01 p.m.	C.P.	F	13.6	2690	2557	2509	33.48
B 506	Feb. 23	12:20 p.m.	G.B.	F	13.2	2712	2578	2541	33.75
B 507	Mar. 2	3:00 p.m.	C.P.	R	15.5	2700	2567	2481	33.60
B 508	Mar. 2	3:15 p.m.	C.P.	R	14.4	2701	2568	2505	33.61
B 509	Mar. 10	9:45 a.m.	C.P.	H	14.4	2690	2557	2494	33.48
B 510	Mar. 10	10:00 a.m.	G.B.	H	16.7	2711	2577	2464	33.74
B 511	Mar. 16	2:00 p.m.	C.P.	R	14.2	2714	2580	2523	33.78
B 512	Mar. 16	2:15 p.m.	G.B.	R	15.6	2710	2576	2489	33.73
B 513	Mar. 23	9:40 a.m.	C.P.	H	12.6	2708	2574	2548	33.70
B 514	Mar. 23	10:00 a.m.	G.B.	H	14.8	2742	2607	2536	34.12
B 515	Mar. 31	4:00 p.m.	C.P.	R	14.4	2712	2578	2516	33.75
B 516	Mar. 31	4:15 p.m.	G.B.	R	16.7	2762	2626	2512	34.37
B 517	Apr. 20	12:30 p.m.	C.P.	F	17.3	2713	2579	2452	33.76
B 518	Apr. 20	12:45 p.m.	G.B.	F	20.1	2813	2674	2475	35.01
B 519	Apr. 27	12:01 p.m.	C.P.	R	17.2	2711	2577	2452	33.74
B 520	Apr. 27	12:15 p.m.	G.B.	R	19.8	2784	2646	2457	34.65
B 521	May 4	9:00 a.m.	C.P.	F	17.0	2712	2578	2458	33.75
B 522	May 4	9:15 a.m.	G.B.	F	20.6	2815	2676	2464	35.03
B 523	May 11	12:01 p.m.	C.P.	R	16.4	2712	2578	2472	33.75
B 524	May 11	12:15 p.m.	G.B.	R	23.2	2834	2695	2411	35.26
B 525	May 19	12:01 p.m.	C.P.	F	17.2	2715	2581	2456	33.79
B 526	May 19	12:15 p.m.	G.B.	F	21.2	2876	2734	2509	35.79
B 527	May 26	12:01 p.m.	C.P.	R	17.0	2718	2584	2464	33.83
B 528	May 26	12:15 p.m.	G.B.	R	21.4	2786	2648	2415	34.67
B 529	June 1	9:20 a.m.	C.P.	F	16.8	2714	2580	2464	33.78
B 530	June 1	9:30 a.m.	G.B.	F	21.5	2843	2704	2467	35.37
B 531	June 6	9:30 a.m.	C.P.	R	16.5	2715	2581	2472	33.79
B 532	June 6	9:40 a.m.	G.B.	R	20.6	2857	2716	2506	35.55
B 533	June 23	11:00 a.m.	G.B.	R	21.5	2873	2731	2497	35.75
B 534	June 23	11:15 p.m.	C.P.	R	.....	2720	2586	...	33.85
B 535	Nov. 24	4:30 p.m.	C.P.	R	16.8	2704	2571	2454	33.66
B 536	Nov. 24	4:45 p.m.	G.B.	R	16.9	2758	2622	2504	34.33
B 537	Nov. 30	2:45 p.m.	C.P.	F	15.4	2712	2578	2495	33.75
B 538	Nov. 30	3:00 p.m.	G.B.	F	15.4	2761	2624	2541	34.36
B 539	Dec. 8	2:00 p.m.	C.P.	R	14.8	2692	2559	2488	33.50
B 540	Dec. 8	2:15 p.m.	G.B.	R	15.0	2703	2569	2495	33.64
B 541	Dec. 14	12:30 p.m.	C.P.	F	14.2	2719	2584	2526	33.84
B 542	Dec. 14	12:45 p.m.	G.B.	F	14.8	2756	2620	2549	34.30
B 543	Dec. 21	12:30 p.m.	C.P.	R	14.5	2698	2565	2500	33.58
B 544	Dec. 21	1:00 p.m.	G.B.	R	14.0	2730	2595	2541	33.97
	1914								
B 545	Jan. 4	12:30 p.m.	C.P.	R	13.2	2698	2565	2527	33.58
B 546	Jan. 4	1:00 p.m.	G.B.	R	14.0	2724	2590	2535	33.90
B 547	Jan. 11	6:00 p.m.	G.B.	R	13.8	2714	2580	2531	33.78
B 548	Jan. 11	6:15 p.m.	C.P.	R	12.6	2701	2567	2541	33.61
B 549	Jan. 19	2:00 p.m.	C.P.	R	14.6	2696	2562	2496	33.55
B 550	Jan. 19	2:20 p.m.	G.B.	R	15.2	2719	2584	2505	33.84
B 551	Feb. 2	3:00 p.m.	C.P.	F	14.4	2693	2560	2497	33.51
B 552	Feb. 2	3:30 p.m.	G.B.	F	14.6	...	...	...	...
B 553	Feb. 8	6:00 p.m.	C.P.	R	14.2	2696	2562	2505	33.55
B 554	Feb. 8	6:15 p.m.	G.B.	R	15.0	2708	2574	2500	33.70
B 555	Feb. 14	3:00 p.m.	G.B.	L	15.2	2686	2553	2475	33.42

Table 2.—Data Relative to San Diego Bay—(*Concluded*)

Water sample number	Date 1914	Time of day	Position	Tide	Temperature in centigrade	Specific gravity $S\frac{0°}{4°0}$	Specific gravity $S\frac{17°5}{17°5}$	Specific gravity $S\frac{t°}{4°0}$	Salinity S ‰
B 556	Feb. 14	3:30 p.m.	C.P.	L	14.4	2693	2560	2497	33.51
B 557	Feb. 21	10:30 a.m.	C.P.	F	15.0	2700	2566	2492	33.60
B 558	Feb. 21	10:45 a.m.	G.B.	F	16.2	2708	2574	2472	33.70
B 559	Mar. 1	8:30 a.m.	C.P.	R	14.8	2686	2533	2483	33.42
B 560	Mar. 1	8:45 a.m.	G.B.	R	16.8	2702	2568	2452	33.62
B 561	Mar. 8	9:30 a.m.	C.P.	F	15.0	2693	2560	2485	33.51
B 562	Mar. 8	9:45 a.m.	G.B.	F	17.6	2688	2555	2420	33.46
B 563	Mar. 16	10:00 a.m.	C.P.	R	16.0	2698	2565	2467	33.58
B 564	Mar. 16	10:15 a.m.	G.B.	R	18.2	2706	2572	2423	33.68
B 565	Mar. 22	9:40 a.m.	C.P.	F	16.4	2684	2551	2446	33.40
B 566	Mar. 22	10:00 a.m.	G.B.	F	18.6	2704	2571	2411	33.66
B 567	Mar. 30	11:30 a.m.	C.P.	H	16.8	2691	2558	2441	33.49
B 568	Mar. 30	11:45 a.m.	G.B.	H	18.0	2710	2576	2433	33.73
B 569	Apr. 4	2:30 p.m.	C.P.	R	16.6	2697	2564	2452	33.57
B 570	Apr. 4	2:45 p.m.	G.B.	R	18.4	2709	2575	2421	33.71
B 571	Apr. 14	3:15 p.m.	C.P.	F	14.0	2689	2556	2502	33.47
B 572	Apr. 14	3:30 p.m.	G.B.	F	19.6	2729	2594	2409	33.96
B 573	Apr. 17	6:30 a.m.	C.P.	F	17.2	.....	.....	.....	.....
B 574	May 3	6:30 a.m.	C.P.	F	16.6	2692	2559	2447	33.50
B 575	May 3	6:45 a.m.	G.B.	F	18.0	2688	2555	2410	33.46
B 576	June 14	10:20 a.m.	C.P.	....	18.4	2726	2591	2437	33.93
B 577	June 14	10:30 a.m.	G.B.	....	19.4	.....	.....	.....	.....
B 578	June 21	4:30 p.m.	G.B.	....	21.2	.....	.....	.....	.....
B 579	June 25	6:15 p.m.	G.B.	....	19.8	.....	.....	.....	.....
B 580	June 28	6:30 p.m.	C.P.	....	20.2	2729	2594	2394	33.96
B 581	July 5	3:15 p.m.	G.B.	....	23.0	.....	.....	.....	.....
B 582	July 19	10:45 a.m.	C.P.	....	14.0	2709	2575	2522	33.71
B 583	July 19	11:15 a.m.	G.B.	....	21.0	.....	.....	.....	.....
B 584	July 26	11:15 a.m.	C.P.	....	.....	2713	2579	.....	33.77
B 585	Aug. 3	7:30 a.m.	C.P.	....	12.1	2705	2571	2555	33.67
B 586	Aug. 3	7:45 a.m.	G.B.	....	22.0	.....	.....	.....	.....
B 587	Aug. 10	10:00 a.m.	C.P.	....	14.2	2719	2584	2526	33.84
B 588	Aug. 16	4:00 p.m.	C.P.	....	15.0	2719	2584	2509	33.84
B 589	Aug. 16	4:20 p.m.	G.B.	....	21.0	.....	.....	.....	.....
B 590	Sept. 7	12:01 p.m.	C.P.	....	18.2	2706	2572	2423	33.68
B 591	Sept. 27	12:01 p.m.	G.B.	....	20.0	.....	.....	.....	.....

EXPLANATION OF TABLE 3

This table includes the field data relative to all plankton collections made from 1913 to 1915 inclusive for quantitative investigations.

First column.—Numbers under which the collections are accessioned; they are arranged in chronological order irrespective of the nature of the haul. The letter *L* or *R* relates either to the left or right haul of the duplicate ones made with the "serial closing apparatus" (see p. 209).

Second column.—Apparatus used in making the collections; K.B. refers to the Kofoid water bottle (see p. 212); S.000 refers to the serial closing apparatus (see p. 209), the nets of which are equivalent in size and filtering capacity to the K.000; K.000, and all remaining symbols refer to nets of the mesh indicated, and having the dimensions given in Appendix 1, page 201 of our former (1915) report.

Third and fourth columns.—Time of day and duration of haul entered to the nearest minute.

Fifth column.—Section; for explanation see page 217.

Sixth and seventh columns.—Latitude and longitude entered to the nearest 0.1 when the error was within 0.5, and to the nearest minute when the error was larger; see explanation to table 1, page 218.

Eighth column.—Depth of haul entered to the nearest meter above and to the nearest five below 200 meters; for error see former report (1915, p. 20).

Ninth column.—Numbers indicating water samples taken in connection with haul (see table 1). Since 1912 water samples have frequently been taken at the beginning and end of each haul; when only one was obtained its entry in the left or right hand part of the column means that it was taken nearest the beginning or end of the haul.

Tenth column.—Miscellaneous remarks relative to hauls; unless otherwise stated the apparatus worked properly so far as known.

Table 3.—Plankton Field Data

Haul number	Apparatus used	Time of day	Duration	Section	Position		Depth in meters	Water sample numbers	Remarks
					N lat.	W long.			
					February 15, 1913				
3598	000c	9:22 a.m.	20	40_4	32° 22.4	117° 21.2	0	3855, ...	
3599	12	9:22 a.m.	20	40_4	32 22.4	117 21.2	0	3855, ...	
3600	000c	9:55 a.m.	107	40_4	32 22.4	117 21.2	0	3856, 3857	
3601	12	9:55 a.m.	107	40_4	From 9:55 a.m. to		0	3856, 3857	
3602	000c	11:55 a.m.	10	40_4	2:25 p.m. the boat		0	3858, ...	
3603	12	11:55 a.m.	10	40_4	drifted from the		0	3858, ...	
3604	000c	12:12 p.m.	38	40_4	above position		0	.....	
3605	12	12:12 p.m.	38	40_4	to the following		0	.....	
3606	000c	1:00 p.m.	70	$40_{3.5}$	position		0	3875, ...	
3607	12	1:00 p.m.	70	$40_{3.5}$	32° 16.7	117° 19.0	0	3875, ...	
					April 16, 1913				
3608	000c	6:20 a.m.	20	40_4	32 22.4	117 21.2	0	4032, ...	Position throughout
3609	12	6:20 a.m.	20	40_4	32 22.4	117 21.2	0	4032, ...	day maintained by
3610	000c	7:15 a.m.	31	40_4			0	4033, ...	"steam" within ¼
3611	12	7:15 a.m.	31	40_4	32 22.4	117 21.2	0	4033, ...	mile of that entered
3612	000c	8:00 a.m.	73	40_4	32 22.4	117 21.2	0	4034, 4037	
3613	12	8:00 a.m.	73	40_4	32 22.4	117 21.2	0	4034, 4037	
3614	K.000	8:19 a.m.	10	40_4	32 22.4	117 21.2	500	4035, 4036	
3615	K.000	9:04 a.m.	9	40_4	32 22.4	117 21.2	400	4038, 4039	
3616	12	9:42 a.m.	92	40_4	32 22.4	117 21.2	0	4040, 4045	
3617	K.000	9:48 a.m.	9	40_4	32 22.4	117 21.2	300	4041, ...	
3618	K.000	10:17 a.m.	8	40_4	32 22.4	117 21.2	200	4043, ...	
3619	K.000	10:40 a.m.	8	40_4	32 22.4	117 21.2	150	.....	
3620	K.000	10:59 a.m.	8	40_4	32 22.4	117 21.2	125	4046, ...	
3621	K.000	11:25 a.m.	6	40_4	32 22.4	117 21.2	100	4047, ...	
3622	000c	11:26 a.m.	40	40_4	32 22.4	117 21.2	0	4048, 4052	
3623	12	11:26 a.m.	40	40_4	32 22.4	117 21.2	0	4048, 4052	
3624	K.000	11:41 a.m.	6	40_4	32 22.4	117 21.2	75	4049, 4050	
3625	K.000	11:59 a.m.	6	40_4	32 22.4	117 21.2	60	4051, 4053	
3626	000c	12:44 p.m.	61	40_4	32 22.4	117 21.2	0	4055, 4076	
3627	12	12:44 p.m.	61	40_4	32 22.4	117 21.2	0	4055, 4076	
3628	K.000	12:45 p.m.	7	40_4	32 22.4	117 21.2	50	4054, 4056	
					April 17, 1913				
3629	K.000	5:45 a.m.	6	40_4	32 22.4	117 21.2	5	4077, 4080	See also 4079
3630	000c	5:56 a.m.	58	40_4	From 5:48 to 8:50		0	4078, 4086	Hauls 3629 to 3641
3631	12	5:56 a.m.	58	40_4	a.m. the boat		0	4078, 4086	were made while
3632	K.000	6:10 a.m.	6	40_4	drifted from the		7	4081, 4082	steaming slowly
3633	K.000	6:22 a.m.	6	40_4	above position		10	4083, 4084	against the drift
3634	K.000	6:33 a.m.	7	40_4	to the following		12	4085, 4087	
3635	K.000	6:45 a.m.	7	40_4			15	4088, ...	
3636	K.000	7:18 a.m.	7	40_5			17	4092, ...	
3637	000c	7:22 a.m.	78	40_5			0	4091, 4099	See also 4094
3638	12	7:22 a.m.	78	40_5			0	4091, 4099	
3639	K.000	7:32 a.m.	6	40_5			20	4093, ...	
3640	K.000	8:17 a.m.	6	40_5	32° 22.6	117° 22.1	25	4095, 4096	
3641	K.000	8:28 a.m.	6	40_5	position		30	4097, 4098	
					August 7, 1913				
3642	000c	10:56 a.m.	44	62_{21}	34 2.2	119 11.6	4	4316, ...	Haul 3642 ended at
3643	000c	1:15 p.m.	77	64_{24}	33 58.4	119 19.5	0	4327, 4345	34° 1.6 N and
3644	000c	4:03 p.m.	27	66_{23}	33 55.5	119 29.0	0	4346, 4347	119° 10.5 W
					August 8, 1913				
3645	000c	9:55 a.m.	45	63_{19}	33 35.0	119 16.0	0	4376, 4389	
3646	000c	1:37 p.m.	67	59_{22}	33 52.0	118 57.5	0	4405, ...	Haul 3646 ended at
3647	000c	7:00 p.m.	75	(57_{24})	34 0.8	118 46.4	4	4424, ...	33° 50.0 N and
					August 9, 1913				
3648	000c	7:27 a.m.	56	(58_{24})	33 57.7	118 51.0	4	4451, ...	118° 55.0 W
3649	000c	9:05 a.m.	67	58_{21}	33 56.5	118 52.0	0	4473, ...	
					August 10, 1913				
3650	000c	7:55 a.m.	20	(53_{21})	33 44.5	118 26.2	0	4519, ...	Haul 3650 made under steam

TABLE 3.—PLANKTON FIELD DATA—(*Continued*)

Haul number	Apparatus used	Time of day	Duration	Section	Position		Depth in meters	Water sample numbers	Remarks
					N lat.	W long.			
					September 12, 1913				
3651	K.B.	3:15 p.m.	....	40_4	32 22.4	117 21.2	1	4609, ...	All K.B. hauls from
3652	K.B.	3:35 p.m.	....	40_4	From 3:15 to 4:48		5	4611, ...	3651 to 3838 are
3653	K.B.	3:42 p.m.	....	40_4	p.m. boat drifted		9	.....	probably defective,
3654	K.B.	3:50 p.m.	....	40_4	from above to		18	.....	the bottle not
3655	K.B.	3:58 p.m.	....	40_4	following position		27	.....	closing properly
3656	K.B.	4:08 p.m.	....	40_4			37		
3657	K.B.	4:16 p.m.	....	40_4			46		
3658	K.B.	4:25 p.m.	....	40_4	32° 20.5	117° 19.7	55		
3659	K.B.	6:02 p.m.	....	40_4	32 22.4	117 21.2	73		
3660	K.B.	6:10 p.m.	....	40_4	From 5:35 to 8:00		92		
3661	K.B.	6:25 p.m.	....	40_4	pm. boat drifted		110		
3662	K.B.	6:42 p.m.	....	40_4	from above to		147		
3663	K.B.	7:00 p.m.	....	40_4	following position		185		
3664	K.B.	7:20 p.m.	....	40_4			230		
3665	K.B.	7:40 p.m.	....	40_4	32° 20.0	117° 19.1	275		
3666	K.B.	8:50 p.m.	....	40_4	32 22.4	117 21.2	365		
3667	K.B.	9:05 p.m.	....	40_4	32 22.2	117 20.9	550		
3668	K.B.	9:30 p.m.	....	40_4	32 21.9	117 20.6	735		
					September 13, 1913				
3669	K.B.	6:20 p.m.	....	40_4	32 22.4	117 21.2	1	4621,	
3670	K.B.	6:30 p.m.	....	40_4	From 6:15 to 8:12		5	4622,	
3671	K.B.	6:42 p.m.	....	40_4	pm. boat drifted		9		
3672	K.B.	6:55 p.m.	....	40_4	from above to		18		
3673	K.B.	7:10 p.m.	....	40_4	following position		27		
3674	K.B.	7:20 p.m.	....	40_4			37		
3675	K.B.	7:45 p.m.	....	40_4	32° 21.2	117° 19.1	46		
					September 17, 1913				
3676	K.B.	6:00 p.m.	....	$40_{4.5}$	32 22.4	117 21.2	1	4626, ...	
3677	K.B.	6:06 p.m.	....	40_5	From 5:50 to 8:05		5	4627, ...	
3678	K.B.	6:12 p.m.	....	40_5	p.m. the boat		9		
3679	K.B.	6:18 p.m.	....	40_5	drifted from the		18		
3680	K.B.	6:25 p.m.	....	40_5	above position		27		
3681	K.B.	6:35 p.m.	....	40_5	to the following		37		
3682	K.B.	6:42 p.m.	....	40_5	position		46		
3683	K.B.	6:48 p.m.	....	40_5			55		
3684	K.B.	6:58 p.m.	....	40_5			73		
3685	K.B.	7:06 p.m.	....	40_5			92		
3686	K.B.	7:15 p.m.	....	40_5			110		
3687	K.B.	7:23 p.m.	....	40_5			147		
3688	K.B.	7:32 p.m.	....	40_5			185		
3689	K.B.	7:44 p.m.	....	40_5			230		
3690	K.B.	7:52 p.m.	....	40_5	32° 23.9	117° 21.4	275		
3691	K.B.	8:38 p.m.	....	40_4	32 22.4	117 21.2	365		
3692	K.B.	8:57 p.m.	....	40_4	32 22.4	117 21.2	460		
3693	K.B.	9:12 p.m.	....	40_4	32 22.4	117 21.2	550		
3694	K.B.	9:32 p.m.	....	40_4	32 22.4	117 21.2	735		
3695	K.B.	9:56 p.m.	....	40_4	32 22.4	117 21.2	915		
					September 18, 1913				
3696	K.B.	9:18 p.m.	....	40_4	32 22.4	117 21.2	1	4633, ...	
3697	K.B.	9:24 p.m.	....	40_4	From 9:04 p.m. to		5	4634,	
3698	K.B.	9:36 p.m.	....	40_4	1:46 a.m. the boat		9		
3699	K.B.	9:42 p.m.	....	40_4	drifted from the		18		
3700	K.B.	9:48 p.m.	....	40_4	above position		27		
3701	K.B.	9:54 p.m.	....	40_4	to the following		37		
3702	K.B.	10:02 p.m.	....	40_4	position		46		
3703	K.B.	10:08 p.m.	....	40_4			55		
3704	K.B.	10:15 p.m.	....	40_4			73		
3705	K.B.	10:34 p.m.	....	40_4			92		
3706	K.B.	10:42 p.m.	....	40_4			110		
3707	K.B.	10:55 p.m.	....	40_4			147		
3708	K.B.	11:12 p.m.	....	40_4			185		
3709	K.B.	11:27 p.m.	....	40_4			230		

Table 3.—Plankton Field Data—(*Continued*)

Haul number	Apparatus used	Time of day	Duration	Section	Position N lat.	Position W long.	Depth in meters	Water sample numbers	Remarks
					September 18, 1913				
3710	K.B.	11:34 p.m.		40_2			275		
3711	K.B.	11:47 p.m.		40_4			365		
					September 19, 1913				
3712	K.B.	12:04 a.m.		40_4			460		
3713	K.B.	12:27 a.m.		40_4			550		
3714	K.B.	12:42 a.m.		40_4			735		
3715	K.B.	1:08 a.m.		40_4	32° 21′3	117° 21′9	915		
					September 20, 1913				
3716	K.B.	12:15 a.m.		40_4	32 22.4	117 21.2	1	4642,	
3717	K.B.	12:25 a.m.		40_4	From 12:12 to 2:54		5	4643,	
3718	K.B.	12:35 a.m.		40_4	a.m. the boat		9		
3719	K.B.	12:42 a.m.		40_4	drifted from the		18		
3720	K.B.	1:15 a.m.		40_4	above position		27		
3721	K.B.	1:27 a.m.		40_4	to the following		37		
3722	K.B.	1:35 a.m.		40_4	position		46		
3723	K.B.	1:47 a.m.		40_4			55		
3724	K.B.	1:54 a.m.		40_4			73		
3725	K.B.	2:04 a.m.		40_4			92		
3726	K.B.	2:12 a.m.		40_4			110		
3727	K.B.	2:22 a.m.		40.5_4			147		
3728	K.B.	2:34 a.m.		41_4			185		
3729	K.B.	2:45 a.m.		41_4	32° 22′3	117° 22′8	230		
3730	K.B.	3:19 a.m.		40_4	32 22.4	117 21.2	275		
3731	K.B.	3:35 a.m.		40_4	32 22.2	117 20.9	365		
3732	K.B.	3:50 a.m.		40_4	32 22.0	117 20.7	460		
3733	K.B.	4:10 a.m.		40_4	32 21.6	117 20.2	550		
					September 21, 1913				
3734	K.B.	3:22 a.m.		40_4	32 22.4	117 21.2	1	4651,	
3735	K.B.	3:26 a.m.		40_4	From 3:20 to 5:34		5	4652,	
3736	K.B.	3:52 a.m.		40_4	a.m. the boat		9		
3737	K.B.	4:13 a.m.		40_4	drifted from the		18		
3738	K.B.	4:20 a.m.		40_4	above position		27		
3739	K.B.	4:26 a.m.		40_4	to the following		37		
3740	K.B.	4:41 a.m.		40_4	position		46		
3741	K.B.	4:53 a.m.		40_4			55		
3742	K.B.	5:01 a.m.		40_4			73		
3743	K.B.	5:10 a.m.		40_4			92		
3744	K.B.	5:17 a.m.		40_4			110		
3745	K.B.	5:27 a.m.		40_4	32° 21′9	117° 19′8	147		
3746	K.B.	6:00 a.m.		40_4	32 22.4	117 21.2	185		
3747	K.B.	6:12 a.m.		40_4	From 5:56 to 8:58		230		
3748	K.B.	6:24 a.m.		40_4	a.m. the boat		275		
3749	K.B.	6:40 a.m.		40_4	drifted from the		365		
3750	K.B.	6:57 a.m.		40_4	above position		460		
3751	K.B.	7:17 a.m.		40_4	to the following		550		
3752	K.B.	8:08 a.m.		40_4	position		735		
3753	K.B.	8:36 a.m.		40_4	32° 21′2	117° 20′6	915		
					September 22, 1913				
3754	K.B.	6:10 a.m.		40_4	32 22.4	117 21.2	1	4663,	
3755	K.B.	6:15 a.m.		40_4	From 6:07 to 7:57		5	4664,	
3756	K.B.	6:19 a.m.		40_4	a.m. the boat		9		
3757	K.B.	6:25 a.m.		40_3	drifted from the		18		
3758	K.B.	6:35 a.m.		40_3	above position		27		
3759	K.B.	6:43 a.m.		40_3	to the following		37		
3760	K.B.	6:49 a.m.		40_3	position		46		
3761	K.B.	6:56 a.m.		40_3			55		
3762	K.B.	7:04 a.m.		40_3			73		
3763	K.B.	7:13 a.m.		40_3			92		
3764	K.B.	7:20 a.m.		40_3			110		
3765	K.B.	7:29 a.m.		40_3	32° 23′2	117° 20′2	147		
3766	K.B.	8:13 a.m.		40_4	32 22.4	117 21.2	185		
3767	K.B.	8:26 a.m.		40_4	32 22.4	117 21.2	230		

TABLE 3.—PLANKTON FIELD DATA—(*Continued*)

Haul number	Apparatus used	Time of day	Duration	Section	Position N lat.	Position W long.	Depth in meters	Water sample numbers	Remarks
					September 22, 1913				
3768	K.B.	8:45 a.m.	....	40$_5$	32 23.2	117 20.6	275		
3769	K.B.	9:00 a.m.	....	40$_5$	32 23.2	117 20.3	365		
3770	K.B.	9:16 a.m.	....	40$_5$	32 23.3	117 20.1	466		
3771	K.B.	9:35 a.m.	....	40$_5$	32 23.3	117 19.8	550		
3772	K.B.	10:12 a.m.	....	40$_4$	32 22.4	117 21.2	735		
3773	K.B.	10:39 a.m.	....	40$_4$	32 22.3	117 20.6	915		
					September 23, 1913				
3774	K.B.	9:16 a.m.	....	40$_5$	32 22.4	117 21.2	1	4674,	
3775	K.B.	9:22 a.m.	....	40$_5$	32 22.4	117 21.2	5	4675,	
3776	K.B.	9:28 a.m.	....	40$_5$	From 8:59 to 11:40		9		
3777	K.B.	9:38 a.m.	....	40$_5$	a.m. the boat		18		
3778	K.B.	9:44 a.m.	....	40$_5$	drifted from the		27		
3779	K.B.	9:51 a.m.	....	40$_5$	above position		37		
3780	K.B.	10:00 a.m.	....	40$_5$	to the following		46		
3781	K.B.	10:07 a.m.	....	40$_5$	position		55		
3782	K.B.	10:16 a.m.	....	40$_5$			73		
3783	K.B.	10:25 a.m.	....	40$_5$			92		
3784	K.B.	10:37 a.m.	....	40$_5$			110		
3785	K.B.	10:46 a.m.	....	40$_5$			147		
3786	K.B.	10:56 a.m.	....	40$_5$			185		
3787	K.B.	11:22 a.m.	....	40$_5$			230		
3788	K.B.	11:32 a.m.	....	40$_5$	32° 23.7	117° 20.5	275		
3789	K.B.	12:25 p.m.	....	40$_4$	32 22.4	117 21.2	365		
3790	K.B.	12:58 p.m.	....	40$_4$	From 11:58 a.m. to		460		
3791	K.B.	1:15 p.m.	....	40$_4$	2:01 p.m. boat		550		
3792	K.B.	1:44 p.m.	....	40$_4$	drifted from above to following position		735		
3793	K.B.	2:00 p.m.	....	40$_5$	32° 22.1	117° 19.8	915		
3794	K.B.	3:15 p.m.	....	40$_5$	32 22.6	117 20.8	1100		
					September 24, 1913				
3795	K.B.	12:19 p.m.	....	40$_4$	32 22.4	117 21.2	1	4680,	
3796	K.B.	12:30 p.m.	....	40$_4$	From 11:50 a.m. to		5	4681,	
3797	K.B.	12:36 p.m.	....	40$_4$	1:20 p.m. the boat		9		
3798	K.B.	12:46 p.m.	....	40$_4$	drifted from above		18		
3799	K.B.	12:53 p.m.	....	40$_4$	to following position		27		
3800	K.B.	1:00 p.m.	....	40$_4$			37		
3801	K.B.	1:13 p.m.	....	40$_4$	32° 22.0	117° 20.1	46		
3802	K.B.	1:41 p.m.	....	40$_4$	32 22.4	117 21.2	55		
3803	K.B.	1:49 p.m.	....	40$_4$	From 1:38 to 3:00		73		
3804	K.B.	1:57 p.m.	....	40$_4$	p.m. the boat		92		
3805	K.B.	2:06 p.m.	....	40$_4$	drifted from the		110		
3806	K.B.	2:15 p.m.	....	40$_4$	above position		147		
3807	K.B.	2:26 p.m.	....	40$_4$	to the following		185		
3808	K.B.	2:40 p.m.	....	40$_4$	position		230		
3809	K.B.	2:52 p.m.	....	40$_4$	32° 21.6	117° 20.9	275		
3810	K.B.	3:30 p.m.	....	40$_4$	32 22.4	117 21.2	365		
3811	K.B.	3:47 p.m.	....	40$_4$	From 3:25 to 5:05		460		
3812	K.B.	4:05 p.m.	....	40$_4$	p.m. the boat		550		
3813	K.B.	4:25 p.m.	....	40$_4$	drifted from above to following position		735		
3814	K.B.	4:51 p.m.	....	40$_5$	32° 21.8	117° 20.7	915		
					September 25, 1913				
3815	K.B.	2:04 p.m.	....	40$_5$	32 22.3	117 21.1	73		
3816	K.B.	2:23 p.m.	....	40$_4$	32 22.0	117 20.8	735		
3817	K.B.	3:26 p.m.	....	40$_5$	32 23.5	117 21.7	55		
3818	K.B.	3:35 p.m.	....	40$_4$	32 22.4	117 21.2	73		
3819	K.B.	3:44 p.m.	....	40$_4$	32 22.3	117 21.1	92		
3820	K.B.	3:53 p.m.	....	40$_4$	32 22.2	117 21.0	110		
3821	K.B.	4:02 p.m.	....	40$_4$	32 21.6	117 20.8	147		
3822	K.B.	5:38 p.m.	....	40$_5$	32 23.0	117 21.3	185		
3823	K.B.	5:52 p.m.	....	40$_5$	32 22.4	117 21.2	230		

Table 3.—Plankton Field Data—(*Continued*)

Haul number	Apparatus used	Time of day	Duration	Section	Position N lat.	Position W long.	Depth in meters	Water sample numbers	Remarks
					September 25, 1913				
3824	K.B.	6:06 p.m.		40_5	From 5:50 to 7:40		110		
3825	K.B.	6:19 p.m.		40_4	p.m. the boat		550		
3826	K.B.	6:47 p.m.		40_4	drifted from above to following position		735		
3827	K.B.	7:10 p.m.		40_4	32° 20′0	117° 19′3	915		
3828	K.B.	11:20 p.m.		40_4	32 22	117 21	9		
					September 26, 1913				
3829	K.B.	11:36 p.m.		40_4	From 11:15 p.m. on		460		
3830	K.B.	12:02 a.m.		40_4	Sept. 25 to 5:15		5	4691,	
3831	K.B.	12:08 a.m.		40_4	a.m. on Sept. 26		9		
3832	K.B.	12:16 a.m.		40_4	boat drifted from		275		
3833	K.B.	12:30 a.m.		40_4	above to following		365		
3834	K.B.	4:55 a.m.		40_2	position		1	4692,	
3835	K.B.	5:01 a.m.		40_2	32° 9′	117° 19′	27		
3836	K.B.	7:20 a.m.		40_4	32 22.4	117 21.2	735		
3837	K.B.	7:57 a.m.		40_4	32 22.4	117 21.2	915		
3838	K.B.	8:25 a.m.		40_4	32 22.4	117 21.2	1	4693,	
					May 8, 1914				
3839	000e	5:42 a.m.	5	40_5	32 22.7	117 19.2	0		Cloudy and calm until
3840	K.000	5:50 a.m.	6	40_5	From 5:38 to 9:17		9	4695,	7:00 a.m.; sun out
3841	K.000	5:50 a.m.	6	40_5	a.m. the boat		0		intermittently until
3842	K.000e	5:50 a.m.	6	40_5	steamed from the		0		9:00 a.m.; bright
3843	K.000	6:14 a.m.	5	40_5	above to the		9	4696, 4697	and clear throughout
3844	K.000	6:14 a.m.	5	40_5	following position		0		remainder of day
3845	K.000e	6:14 a.m.	5	40_5			0		
3846	K.000	6:28 a.m.	6	40_5			17	4698, 4699	
3847	K.000	6:28 a.m.	6	40_5			0		
3848	K.000e	6:28 a.m.	6	40_5			0		
3849	K.000	6:43 a.m.	5	40_5			17	4700, 4701	
3850	K.000	6:43 a.m.	5	40_5			0		
3851	K.000e	6:43 a.m.	5	40_5			0		All K.000 and K.000e
3852	K.000	6:53 a.m.	5	40_5			44	4703, 4704	hauls during May,
3853	K.000	6:53 a.m.	5	40_5			0	4702,	1914, were made
3854	K.000e	6:53 a.m.	5	40_5			0	4702,	while the boat was
3855	K.000	7:11 a.m.	5	40_5			44		slowly steaming
3856	K.000	7:11 a.m.	5	40_5			0		against the drift
3857	K.000e	7:11 a.m.	5	40_5			0		
3858	K.000	7:28 a.m.	5	40_5			88	4706, 4707	
3859	K.000	7:28 a.m.	5	40_5			0	4705,	
3860	K.000e	7:28 a.m.	5	40_5			0	4705,	
3861	K.000	7:45 a.m.	5	40_5			90	4708, 4709	
3862	K.000	7:45 a.m.	5	40_5			0		
3863	K.000e	7:45 a.m.	5	40_5			0		
3864	K.000	8:02 a.m.	5	40_5			128	4711, 4712	
3865	K.000	8:02 a.m.	5	40_5			0	4710,	
3866	K.000e	8:02 a.m.	5	40_5			0	4710,	
3867	K.000	8:21 a.m.	5	40_5			133	4713, 4714	
3868	K.000	8:21 a.m.	5	40_5			0		
3869	K.000e	8:21 a.m.	5	40_5			0		
3870	K.000	8:39 a.m.	5	40_5			168	4716, 4717	
3872	K.000e	8:39 a.m.	5	40_5			0	4715,	
3873	K.000	8:57 a.m.	5	40_5			170	4718,	
3874	K.000	8:57 a.m.	5	40_5			0		
3875	K.000e	8:57 a.m.	5	40_5			0		
3876	000	9:12 a.m.	5	40_5			0	4720,	
3877	000e	9:12 a.m.	5	40_5	32° 22′7	117° 18′9	0	4720,	
3878	000	10:12 a.m.	5	40_5	32 22.7	117 19.2	0	4721,	From 10:12 a.m. to
3879	000e	10:12 a.m.	5	40_5	32 22.7	117 19.2	0	4721,	6:05 p.m. the position
3880	K.000	10:23 a.m.	5	40_5	32 22.7	117 19.2	8	4722,	was maintained
3881	K.000	10:23 a.m.	5	40_5	32 22.7	117 19.2	0		within ½ mile of
3882	K.000e	10:23 a.m.	5	40_5	32 22.7	117 19.2	0		that entered
3883	K.000	10:34 a.m.	5	40_5	32 22.7	117 19.2	9	4723, 4724	

TABLE 3.—PLANKTON FIELD DATA—(*Continued*)

Haul number	Apparatus used	Time of day	Duration	Section	Position N lat.	Position W long.	Depth in meters	Water sample numbers	Remarks
					May 8, 1914				
3884	K.000	10:34 a.m.	5	40,	32 22.7	117 19.2	0		
3885	K.000c	10:34 a.m.	5	40,	32 22.7	117 19.2	0		
3886	K.000	10:45 a.m.	5	40,	32 22.7	117 19.2	16	4725,	Imperfectly closed
3887	K.000	10:45 a.m.	5	40,	32 22.7	117 19.2	0		
3888	K.000c	10:45 a.m.	5	40,	32 22.7	117 19.2	0		
3889	K.000	10:56 a.m.	5	40,	32 22.7	117 19.2	18	4726,	Imperfectly closed
3890	K.000	10:56 a.m.	5	40,	32 22.7	117 19.2	0		
3891	K.000c	10:56 a.m.	5	40,	32 22.7	117 19.2	0		
3892	K.000	11:10 a.m.	5	40,	32 22.7	117 19.2	44	4727,	Failed to close
3893	K.000	11:10 a.m.	5	40,	32 22.7	117 19.2	0		
3894	K.000c	11:10 a.m.	5	40,	32 22.7	117 19.2	0		
3895	K.000	11:22 a.m.	5	40,	32 22.7	117 19.2	40	4729,	Failed to close
3896	K.000	11:22 a.m.	5	40,	32 22.7	117 19.2	0	4728,	
3897	K.000c	11:22 a.m.	5	40,	32 22.7	117 19.2	0	4728,	
3898	K.000	11:44 a.m.	5	40	32 22.7	117 19.2	40	4730,	Failed to close
3899	K.000	11:44 a.m.	5	40,	32 22.7	117 19.2	0		
3900	K.000c	11:44 a.m.	5	40,	32 22.7	117 19.2	0		
3901	000c	11:52 a.m.	28	40,	32 22.7	117 19.2	0	4731,	
3902	K.000	12:50 p.m.	5	40,	32 22.7	117 19.2	46	4732, 4733	
3903	K.000	12:50 p.m.	5	40,	32 22.7	117 19.2	0		
3904	K.000c	12:50 p.m.	5	40,	32 22.7	117 19.2	0		
3905	K.000	1:02 p.m.	5	40,	32 22.7	117 19.2	88	4734, 4735	Failed to close
3906	K.000	1:02 p.m.	5	40,	32 22.7	117 19.2	0		
3907	K.000c	1:02 p.m.	5	40,	32 22.7	117 19.2	0		
3908	K.000	1:19 p.m.	5	40,	32 22.7	117 19.2	88	4736, 4737	
3909	K.000	1:19 p.m.	5	40,	32 22.7	117 19.2	0		
3910	K.000c	1:19 p.m.	5	40,	32 22.7	117 19.2	0		
3911	K.000	1:34 p.m.	5	40,	32 22.7	117 19.2	124	4738,	Failed to close
3912	K.000	1:34 p.m.	5	40,	32 22.7	117 19.2	0		
3913	K.000c	1:34 p.m.	5	40,	32 22.7	117 19.2	0		
3914	K.000	2:00 p.m.	5	40,	32 22.7	117 19.2	125		
3915	000	6:05 p.m.	7	40,	32 22.7	117 19.2	0	4741,	Sunset, 6:33 p.m.;
3916	000c	6:05 p.m.	7	40,			0	4741,	bright moonlight
3917	K.000	6:25 p.m.	5	40,			9	4742, 4743	throughout evening
3918	K.000	6:25 p.m.	5	40,			0		
3919	K.000c	6:25 p.m.	5	40,			0		
3920	K.000	6:37 p.m.	5	40,			9	4744,	
3921	K.000	6:37 p.m.	5	40,			0		
3922	K.000c	6:37 p.m.	5	40,			0		
3923	K.000	6:50 p.m.	5	40,			18		
3924	K.000	6:50 p.m.	5	40,			0		
3925	K.000c	6:50 p.m.	5	40,			0		
3926	K.000	7:03 p.m.	5	40,			18		
3927	K.000	7:03 p.m.	5	40,			0	4747,	
3928	K.000c	7:03 p.m.	5	40,			0	4747,	
3929	K.000	7:16 p.m.	5	40,			45	4748, 4749	
3930	K.000	7:16 p.m.	5	40,			0		
3931	K.000c	7:16 p.m.	5	40,			0		
3932	K.000	7:35 p.m.	5	40,			45	4750,	
3933	K.000	7:35 p.m.	5	40,			0		
3934	K.000c	7:35 p.m.	5	40,			0		
3935	K.000	7:49 p.m.	5	40,			90	4751, 4752	
3936	K.000	7:49 p.m.	5	40,	From 6:05 to 9:05		0		
3937	K.000c	7:49 p.m.	5	40,	p.m. the boat		0		
3938	K.000	8:09 p.m.	5	40,	steamed from the		136	4753,	
3939	K.000	8:09 p.m.	5	40,	above to the		0		
3940	K.000c	8:09 p.m.	5	40,	following position		0		
3941	K.000	8:40 p.m.	5	40,			165	4754, 4755	
3942	K.000	8:40 p.m.	5	40,			0		
3943	K.000c	8:40 p.m.	5	40,			0		
3944	000c	8:58 p.m.	5	40,	32° 22.1	117° 18.8	0	4756,	

Table 3.—Plankton Field Data—(*Continued*)

Haul number	Apparatus used	Time of day	Duration	Section	Position N lat.	Position W long.	Depth in meters	Water sample numbers	Remarks
					May 9, 1914				
3945	000	9:54 a.m.	5	41,	32 21.0	117 24.0	0	4763,	Cloudy until 10 a.m.,
3946	000c	9:54 a.m.	5	41,			0	4763,	then bright and
3947	K.000	10:13 a.m.	5	41,			9	4764, 4765	clear; heavy sea
3948	K.000	10:13 a.m.	5	41,			0		
3949	K.000c	10:13 a.m.	5	41,			0		
3950	K.000	10:27 a.m.	5	41,	From 9:46 a.m. to		9	, 4768	
3951	K.000	10:27 a.m.	5	41,	12:25 p.m. the boat		0	4766,	
3952	K.000c	10:27 a.m.	5	41,	steamed from the		0	4766,	
3953	K.000	10:41 a.m.	5	41,	above to the		17	4769,	Failed to close
3954	K.000	10:41 a.m.	5	41,	following position		0		
3955	K.000c	10:41 a.m.	5	41,			0		
3956	K.000	10:53 a.m.	5	41,			18	4770,	
3957	K.000	10:53 a.m.	5	41,			0		
3958	K.000c	10:53 a.m.	5	41,			0		
3959	K.000	12:23 p.m.	5	41,			44	, 4772	
3960	K.000	12:23 p.m.	5	41,			0	4771,	
3961	K.000c	12:23 p.m.	5	41,	32° 21.5	117° 23.9	0	4771,	
3962	K.000	12:38 p.m.	5	41,			46		
3963	K.000	12:38 p.m.	5	41,			0		
3964	K.000c	12:38 p.m.	5	41,	From 12:25 to 1:20		0		
3965	K.000	12:54 p.m.	5	40.5,	p.m. the boat		46	, 4773	
3966	K.000	12:54 p.m.	5	40.5,	steamed from the		0		
3967	K.000c	12:54 p.m.	5	40.5,	above to the		0		
3968	K.000	1:10 p.m.	5	40,	following position		84	4774, 4775	
3969	K.000	1:10 p.m.	5	40,			0	, 4776	
3970	K.000c	1:10 p.m.	5	40,			0	, 4776	
3971	K.000	1:25 p.m.	5	40,			137	, 4777	
3972	K.000	1:25 p.m.	5	40,			0	4776,	
3973	K.000c	1:25 p.m.	5	40,	32° 21.2	117° 21.3	0	4776,	
					May 10, 1914				
3974	000	5:53 a.m.	5	41,	32 21.0	117 24.0	0	4784,	Bright and clear
3975	000c	5:53 a.m.	5	41,	32 21.0	117 24.0	0	4784,	throughout day
3976	K.000	6:06 a.m.	5	41,	32 21.0	117 24.0	9	4785, 4786	Position throughout
3977	K.000	6:06 a.m.	5	41,	32 21.0	117 24.0	0		day maintained by
3978	K.000c	6:06 a.m.	5	41,	32 21.0	117 24.0	0		"steam" within ¼
3979	K.000	6:17 a.m.	5	41,	32 21.0	117 24.0	9	4787, 4788	mile of that entered
3980	K.000	6:17 a.m.	5	41,	32 21.0	117 24.0	0		
3981	K.000c	6:17 a.m.	5	41,	32 21.0	117 24.0	0		
3982	K.000	6:39 a.m.	5	41,	32 21.0	117 24.0	0		
3983	K.000c	6:39 a.m.	5	41,	32 21.0	117 24.0	0		
3984	K.000	6:49 a.m.	5	41,	32 21.0	117 24.0	18	, 4791	
3985	K.000	6:49 a.m.	5	41,	32 21.0	117 24.0	0		
3986	K.000c	6:49 a.m.	5	41,	32 21.0	117 24.0	0		
3987	K.000	7:30 a.m.	5	41,	32 21.0	117 24.0	42	, 4794	
3988	K.000	7:30 a.m.	5	41,	32 21.0	117 24.0	0	4792,	
3989	K.000c	7:30 a.m.	5	41,	32 21.0	117 24.0	0	4792,	
3990	K.000	7:43 a.m.	5	41,	32 21.0	117 24.0	44	, 4795	
3991	K.000	7:43 a.m.	5	41,	32 21.0	117 24.0	0		
3992	K.000c	7:43 a.m.	5	41,	32 21.0	117 24.0	0		
3993	K.000	7:55 a.m.	5	41,	32 21.0	117 24.0	88	, 4796	
3994	K.000	7:55 a.m.	5	41,	32 21.0	117 24.0	0		
3995	K.000c	7:55 a.m.	5	41,	32 21.0	117 24.0	0		
3996	K.000	8:10 a.m.	5	41,	32 21.0	117 24.0	88	, 4797	
3997	K.000	8:10 a.m.	5	41,	32 21.0	117 24.0	0		
3998	K.000c	8:10 a.m.	5	41,	32 21.0	117 24.0	0		
3999	K.000	8:26 a.m.	5	41,	32 21.0	117 24.0	130	4799,	
4000	K.000	8:26 a.m.	5	41,	32 21.0	117 24.0	0	4798,	
4001	K.000c	8:26 a.m.	5	41,	32 21.0	117 24.0	0	4798,	
4002	K.000	8:43 a.m.	5	41,	32 21.0	117 24.0	128		
4003	K.000	8:43 a.m.	5	41,	32 21.0	117 24.0	0		
4004	K.000c	8:43 a.m.	5	41,	32 21.0	117 24.0	0		
4005	K.000	9:00 a.m.	5	41,	32 21.0	117 24.0	174		

TABLE 3.—PLANKTON FIELD DATA—(*Continued*)

Haul number	Apparatus used	Time of day	Duration	Section	Position N lat.	Position W long.	Depth in meters	Water sample numbers	Remarks
					May 10, 1914				
4006	K.000	9:00 a.m.	5	41,	32 21.0	117 24.0	0	4800, ...	
4007	K.000c	9:00 a.m.	5	41,	32 21.0	117 24.0	0	4800,	
4008	K.000	9:19 a.m.	5	41,	32 21.0	117 24.0	175	. . , 4801	
4009	K.000	9:19 a.m.	5	41,	32 21.0	117 24.0	0	.	
4010	K.000c	9:19 a.m.	5	41,	32 21.0	117 24.0	0		
4011	000	9:34 a.m.	5	41,	32 21.0	117 24.0	0	4802,	
4012	000c	9:34 a.m.	5	41,	32 21.0	117 24.0	0	4802,	
					May 11, 1914				
4013	000	12:29 a.m.	5	41,	32 21.0	117 24.0	0	4814,	Bright moonlight
4014	000c	12:29 a.m.	5	41,			0	4814,	throughout night
4015	K.000	12:40 a.m.	5	41,			9	4815, 4816	
4016	K.000	12:40 a.m.	5	41,			0	. . . .	
4017	K.000c	12:40 a.m.	5	41,			0		
4018	K.000	12:54 a.m.	5	41,			9	4817, 4818	
4019	K.000	12:54 a.m.	5	41,	From 12:27 to 4:02		0		
4020	K.000c	12:54 a.m.	5	41,	a.m. the boat		0	. .	
4021	K.000	1:07 a.m.	5	41,	steamed from the		18	4819,	Failed to close
4022	K.000	1:07 a.m.	5	41,	above to the		0	. .	
4023	K.000c	1:07 a.m.	5	41,	following position		0		
4024	K.000	1:20 a.m.	5	41,			18	. . .	
4025	K.000	1:20 a.m.	5	41,			0	. . . .	
4026	K.000	1:38 a.m.	5	41,			16		Failed to close
4027	K.000	1:38 a.m.	5	41,			0	. . . . .	
4028	K.000	2:20 a.m.	5	41,			46	. . . . , 4820	
4029	K.000	2:20 a.m.	5	41,			0	. . . . .	
4030	K.000c	2:20 a.m.	5	41,			0	. . . . .	
4031	K.000	2:36 a.m.	5	41,			90	, 4822	
4032	K.000	2:36 a.m.	5	41,			0	4821, . . .	
4033	K.000c	2:36 a.m.	5	41,			0	4821, . . .	
4034	K.000	2:52 a.m.	5	41,			135	. . . . . , 4823	
4035	K.000	2:52 a.m.	5	41,			0	. . . . .	
4036	K.000c	2:52 a.m.	5	41,			0	. . . . .	
4037	K.000	3:13 a.m.	5	41,			185	, 4825	
4038	K.000	3:13 a.m.	5	41,			0	.	
4039	K.000c	3:13 a.m.	5	41,			0		
4040	000	3:28 a.m.	5	41,			0	4826,	
4042	K.000	3:39 a.m.	5	41,			27	4827, 4828	
4043	K.000	3:53 a.m.	5	41,	32° 18.5	117° 27.2	30	4829, 4830	
					May 12, 1914				
4044	000	12:16 a.m.	5	40,	32 22.7	117 19.2	0	. , 4841	Cloudy but moonlight
4045	000c	12:16 a.m.	5	40,			0	. . , 4841	throughout night
4046	K.000	12:30 a.m.	5	40,			9	4842, 4843	
4047	K.000	12:43 a.m.	5	40,			8	4844, .	Failed to close
4048	K.000	12:55 a.m.	5	40,			17	4845, 4846	
4049	K.000	1:06 a.m.	5	40,			17	4847, 4848	
4050	K.000	1:19 a.m.	5	40,			35	4849, 4850	
4051	K.000	1:37 a.m.	5	40,			45	4851,	Failed to close
4052	K.000	1:52 a.m.	5	40,			46	4853, . .	
4053	K.000	2:07 a.m.	5	40,			86	. . . . . , 4854	
4054	K.000	2:22 a.m.	5	40,	From 12:12 to 4:10		88	. . . . , 4856	
4055	K.000	2:39 a.m.	5	40,	a.m. the boat		119	. . . . , 4857	
4056	K.000	2:55 a.m.	5	40,	steamed from the		137	. . . . .	
4057	K.000	3:15 a.m.	5	40,	above to the		172	. . . . . , 4859	
4058	K.000	3:34 a.m.	5	40,	following position		172	. . . . . , 4860	
4059	000	3:55 a.m.	5	40,			0	. . . . , 4861	
4060	000c	3:55 a.m.	5	40,			0	, 4861	
4061	K.000	5:04 a.m.	5	40,	32° 20.6	117° 20.2	27	4862, 4863	
					May 14, 1915				
4062L	S.000	6:20 a.m.	15	40,	32 21.0	117 19.7	18	. . . . . , 4918	Clear and smooth
4063R	S.000	6:20 a.m.	15	40,			18	. . . . . , 4918	throughout the
4064L	S.000	6:20 a.m.	15	40,			92	. . . . . , 4919	morning
4065R	S.000	6:20 a.m.	15	40,			92	, 4919	

Table 3.—Plankton Field Data—(*Continued*)

Haul number	Apparatus used	Time of day	Duration	Section	Position N lat.	Position W long.	Depth in meters	Water sample numbers	Remarks
					May 14, 1915				
4066L	S.000	6:57 a.m.	15	40$_4$			18	...., 4921	
4067R	S.000	6:57 a.m.	15	40$_4$			18	...., 4921	
4068L	S.000	6:57 a.m.	15	40$_4$			92	..., 4922	
4069R	S.000	6:57 a.m.	15	40$_4$			92	, 4922	
4070L	S.000	7:33 a.m.	15	40.5$_4$			18	...., 4924	
4071R	S.000	7:33 a.m.	15	40.5$_4$			18	, 4924	
4072L	S.000	7:33 a.m.	15	40.5$_4$			92	....., 4925	
4073R	S.000	7:33 a.m.	15	40.5$_4$			92	, 4925	
4074L	S.000	8:09 a.m.	15	41$_4$			18	....., 4927	
4075R	S.000	8:09 a.m.	15	41$_4$			18	....., 4927	
4076L	S.000	8:09 a.m.	15	41$_4$			92	....., 4928	Probably closed at
4077R	S.000	8:09 a.m.	15	41$_4$			92	...., 4928	20 meters
4078L	S.000	8:43 a.m.	15	41$_5$			18	...., 4930	
4079R	S.000	8:43 a.m.	15	41$_{5.5}$			18	..., 4930	
4080L	S.000	8:43 a.m.	15	41$_{5}$	From 4:25 to 10:50		92	....., 4931	
4081R	S.000	8:43 a.m.	15	41$_{5.5}$	a.m. the boat		92	....., 4931	
4082L	S.000	9:15 a.m.	15	41$_5$	drifted from the		18	....., 4933	
4083R	S.000	9:15 a.m.	15	41$_5$	above to the		18	....., 4933	
4084L	S.000	9:15 a.m.	15	41$_5$	following position		92	....., 4934	
4085R	S.000	9:15 a.m.	15	41$_5$			92	....., 4934	
4086L	S.000	9:45 a.m.	15	41$_4$			18	..., 4936	
4087R	S.000	9:45 a.m.	15	41$_5$			18	....., 4936	
4088L	S.000	9:45 a.m.	15	41$_5$			92	....., 4937	Probably closed at
4089R	S.000	9:45 a.m.	15	41$_5$			92	....., 4937	24 meters
4090L	S.000	10:16 a.m.	15	41$_4$			18	..., 4939	
4091R	S.000	10:16 a.m.	15	41$_5$			18	....., 4939	
4092L	S.000	10:16 a.m.	15	41$_5$			92	....., 4940	
4093R	S.000	10:16 a.m.	15	41$_5$	32° 15′7	117° 25′7	92	....., 4940	
4094L	S.000	12:25 p.m.	15	40$_{4.5}$	32 23.0	117 19.4	18	....., 4942	Bright, clear, and
4095R	S.000	12:25 p.m.	15	40$_{4.5}$			18	....., 4942	very rough
4096L	S.000	12:25 p.m.	15	40$_{4.5}$	From 12:10 to 1:30		92	....., 4943	
4097R	S.000	12:25 p.m.	15	40$_{4.5}$	p.m. the boat		92	....., 4943	
4098L	S.000	12:55 p.m.	15	40$_4$	drifted from the		18	..., 4945	
4099R	S.000	12:55 p.m.	15	40$_4$	above to the		18	....., 4945	
4100L	S.000	12:55 p.m.	15	40$_4$	following position		92	....., 4946	
4101R	S.000	12:55 p.m.	15	40$_4$	32° 21′1	117° 19′3	92	....., 4946	
					May 15, 1915				
4102L	S.000	5:32 a.m.	15	40$_4$	32 22.4	117 21.2	18	....., 4948	Bright and clear
4103R	S.000	5:32 a.m.	15	40$_4$			18	....., 4948	throughout day
4104L	S.000	5:32 a.m.	15	40$_4$			92	....., 4949	
4105R	S.000	5:32 a.m.	15	40$_4$			92	....., 4949	
4106L	S.000	6:08 a.m.	15	40$_4$			18	....., 4951	
4107R	S.000	6:08 a.m.	15	40$_4$			18	, 4951	
4108L	S.000	6:08 a.m.	15	40$_4$			92	....., 4952	
4109R	S.000	6:08 a.m.	15	40$_4$			92	..., 4952	
4110L	S.000	6:36 a.m.	15	40$_4$			18	..., 4954	
4111R	S.000	6:36 a.m.	15	40$_4$			18	...., 4954	
4112L	S.000	6:36 a.m.	15	40$_4$			92	.....	Failed to close
4113R	S.000	6:36 a.m.	15	40$_4$			92	.....	
4114L	S.000	7:20 a.m.	15	40$_{4.5}$			18	...., 4956	
4115R	S.000	7:20 a.m.	15	40$_{4.5}$			18	..., 4956	
4116L	S.000	7:20 a.m.	15	40$_{4.5}$			92	, 4957	
4117R	S.000	7:20 a.m.	15	40$_{4.5}$			92	....., 4957	
4118L	S.000	7:53 a.m.	15	40	From 5:20 to 9:25		18	....., 4959	
4119R	S.000	7:53 a.m.	15	40$_5$	a.m. the boat		18	....., 4959	
4120L	S.000	7:53 a.m.	15	40$_5$	drifted from the		92	..., 4960	
4121R	S.000	7:53 a.m.	15	40$_5$	above to the		92	....., 4960	
4122L	S.000	8:25 a.m.	15	40$_5$	following position		18	....., 4962	
4123R	S.000	8:25 a.m.	15	40$_5$			18	....., 4962	
4124L	S.000	8:25 a.m.	15	40$_5$			92	....., 4963	
4125R	S.000	8:25 a.m.	15	40$_5$			92	....., 4963	

TABLE 3.—PLANKTON FIELD DATA—(*Continued*)

Haul number	Apparatus used	Time of day	Duration	Section	Position N lat.	Position W long.	Depth in meters	Water sample numbers	Remarks
					May 15, 1915				
4126L	S.000	8:55 a.m.	15	40_3			18	.....	Failed to close
4127R	S.000	8:55 a.m.	15	40_3			18	.....	
4128L	S.000	8:55 a.m.	15	40_3			73	, 4965	
4129R	S.000	8:55 a.m.	15	40_3	32° 15.0	117° 19.0	73	, 4965	
4130L	S.000	10:37 a.m.	15	40_5	32 23.0	117 19.1	18	, 4967	
4131R	S.000	10:37 a.m.	15	40_5			18	, 4967	
4132L	S.000	10:37 a.m.	15	40_5			92	.....	Failed to close
4133R	S.000	10:37 a.m.	15	40_5			92	.....	
4134L	S.000	11:07 a.m.	15	40_4			18	....., 4969	
4135R	S.000	11:07 a.m.	15	40_4			18	....., 4969	
4136L	S.000	11:07 a.m.	15	40_4			92	.....	Probably closed high
4137R	S.000	11:07 a.m.	15	40_4			92	.....	
4138L	S.000	11:43 a.m.	15	40_4	From 10:30 a.m. to		42	, 4971	
4139R	S.000	11:43 a.m.	15	40_4	1:15 p.m. the boat		42	, 4971	
4140L	S.000	11:43 a.m.	15	40_4	drifted from the		92	, 4972	
4141R	S.000	11:43 a.m.	15	40_4	above to the		92	, 4972	
4142L	S.000	12:35 p.m.	15	40_4	following position		18	....., 4974	
4143R	S.000	12:35 p.m.	15	40_4			18	....., 4974	
4144L	S.000	12:35 p.m.	15	40_4			92	.....	
4145R	S.000	12:35 p.m.	15	40_3			92	.....	Failed to close
4146L	S.000	1:08 p.m.	15	40_4			18	....., 4976	
4147R	S.000	1:08 p.m.	15	40_4			18	....., 4976	
4148L	S.000	1:08 p.m.	15	40_4			92	....., 4977	Opened at 73 meters
4149R	S.000	1:08 p.m.	15	40_4	32° 19.2	117° 18.8	92	....., 4977	
					May 16, 1915				
4150L	S.000	5:27 a.m.	15	40_4	32 20.0	117 20.0	18	....., 4979	Cloudy and smooth
4151R	S.000	5:27 a.m.	15	40_4			18	....., 4979	throughout day
4152L	S.000	5:27 a.m.	15	40_4			92	....., 4980	
4153R	S.000	5:27 a.m.	15	40_4			92	....., 4980	
4154L	S.000	6:00 a.m.	15	40_4			18	....., 4982	
4155R	S.000	6:00 a.m.	15	40_4			18	....., 4982	
4156L	S.000	6:00 a.m.	15	40_4			92	....., 4983	Probably closed at
4157R	S.000	6:00 a.m.	15	40_4			92	....., 4983	84 meters
4158L	S.000	6:27 a.m.	15	40_4			18	....., 4985	
4159R	S.000	6:27 a.m.	15	40_4			18	....., 4985	
4160L	S.000	6:27 a.m.	15	40_4			92	....., 4986	
4161R	S.000	6:27 a.m.	15	40_4			92	....., 4986	
4162L	S.000	6:56 a.m.	15	40_4	From 5:15 to 11:45		18	....., 4988	
4163R	S.000	6:56 a.m.	15	40_4	a.m. the boat		18	....., 4988	
4164L	S.000	6:56 a.m.	15	40_4	drifted from the		92	....., 4989	
4165R	S.000	6:56 a.m.	15	40_4	above to the		92	....., 4989	
4166L	S.000	7:31 a.m.	15	40_4	following position		18	....., 4991	
4167R	S.000	7:31 a.m.	15	40_4			18	....., 4991	
4168L	S.000	7:31 a.m.	15	40_4			92	....., 4992	
4169R	S.000	7:31 a.m.	15	40_4			92	....., 4992	
4170L	S.000	7:59 a.m.	15	40_4			18	....., 4994	
4171R	S.000	7:59 a.m.	15	40_4			18	....., 4994	
4172L	S.000	7:59 a.m.	15	40_4			92	....., 4995	
4173R	S.000	7:59 a.m.	15	40_4			92	....., 4995	
4174L	S.000	8:28 a.m.	15	40_4			18	....., 4997	
4175R	S.000	8:28 a.m.	15	40_4			18	....., 4997	
4176L	S.000	8:28 a.m.	15	40_4			92	....., 4998	
4177R	S.000	8:28 a.m.	15	40_4			92	....., 4998	
4178L	S.000	8:56 a.m.	15	40_4			18	....., 5000	
4179R	S.000	8:56 a.m.	15	40_4			18	....., 5000	
4180L	S.000	8:56 a.m.	15	40_4			92	....., 5001	
4181R	S.000	8:56 a.m.	15	40_4			92	....., 5001	
4182L	S.000	9:24 a.m.	15	40_4			18	....., 5003	
4183R	S.000	9:24 a.m.	15	40_4			18	....., 5003	
4184L	S.000	9:24 a.m.	15	40_4			92	....., 5004	
4185R	S.000	9:24 a.m.	15	40_4			92	....., 5004	
4186L	S.000	9:52 a.m.	15	40_4			18	....., 5006	

Table 3.—Plankton Field Data—(*Concluded*)

Haul number	Apparatus used	Time of day	Duration	Section	Position N lat.	Position W long.	Depth in meters	Water sample numbers	Remarks
				May 16, 1915					
4187R	S.000	9:52 a.m.	15	40_4			18	, 5006	
4188L	S.000	9:52 a.m.	15	40_4			92	, 5007	
4189R	S.000	9:52 a.m.	15	40_4			92	, 5007	
4190L	S.000	10:17 a.m.	15	40_4			18	, 5009	
4191R	S.000	10:17 a.m.	15	40_4			18	, 5009	
4192L	S.000	10:17 a.m.	15	40_4			92	, 5010	
4193R	S.000	10:17 a.m.	15	40_4			92	, 5010	
4194L	S.000	10:42 a.m.	15	40_4			18	, 5012	
4195R	S.000	10:42 a.m.	15	40_4			18	, 5012	
4196L	S.000	10:42 a.m.	15	40_4			92	, 5013	
4097R	S.000	10:42 a.m.	15	40_4			92	, 5013	
4198L	S.000	11:08 a.m.	15	40_4			18	, 5015	
4199R	S.000	11:08 a.m.	15	40_4			18	, 5015	
4200L	S.000	11:08 a.m.	15	40_4			92	, 5016	
4201R	S.000	11:08 a.m.	15	40_4			92	, 5016	
4202L	S.000	11:33 a.m.	15	40_4			22	, 5018	
4203R	S.000	11:33 a.m.	15	40_4			22	, 5018	
4204L	S.000	11:33 a.m.	15	40_4			92	, 5019	
4205R	S.000	11:33 a.m.	15	40_4	32° 20.3	117° 19.0	92	, 5019	

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MADE BY

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OF THE

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1908 TO 1915

BY
GEORGE F. McEWEN
Hydrographer

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SUMMARY AND INTERPRETATION OF THE HYDROGRAPHIC OBSERVATIONS

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1908 TO 1915

BY

GEORGE F. McEWEN

Hydrographer

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INTRODUCTION

The biological survey of the waters of the Pacific adjacent to the coast of Southern California, which was begun by the Marine Biological Association of San Diego in 1901, has been carried on by its successor, the Scripps Institution for Biological Research of the University of California, since 1912. The aim has been to obtain as comprehensive an understanding as possible of the life of the sea, and consequently considerable time and energy have been devoted to the investigations of the hydrographic conditions under which marine organisms live. The hydrographic data thus accumulated, together with all the other field data and a full discussion of the methods of collecting, laboratory analysis, accuracy of results, etc., have been published in detail (Michael and McEwen, 1915, 1916).

However, as Thompson (1904–05, p. 171) says: "We want to learn the general or average hydrographical conditions of temperature, salinity, and current at each place and at each depth, and then to learn the changes or fluctuations that these conditions undergo during the year or longer periods." To realize this ideal obviously demands a very large number of observations taken at small intervals of time and space, and involves the application of methods of averaging and interpolating. Moreover, the results of such observations can not be adequately described or understood without a quantitative investigation of their causal relationships. Quantitative investigation brings the facts of observation into closer relationship, as logical consequences of known principles of physics and chemistry, and also indicates the existence of other important and related phenomena, and emphasizes the need of devising means for their direct observation.

To obtain even a reasonable approximation to the complete knowledge of the hydrographic conditions in this region that we desire will require far more numerous and continuous observations than have yet been made. However, it is believed that the data now available warrant a brief account of the average hydrographic conditions and their fluctuations.

A. THE REGION SURVEYED

1. Number of Observations in Different Portions of the Region

Both in hydrographic and biological investigations it is often desirable to divide the area to be explored into sections of convenient size and to deal separately with the observations made in each section. Rectangular sections, having bases equal to five minutes of longitude and altitudes equal to five minutes of latitude, have proved very convenient in our oceanic investigations (Michael and McEwen, 1915, p. 46). Accordingly, each number written below the maps (pls. 1–3) is that of the section, twenty-five square minutes in area counted from the base-line, 114° W, and each number in the column at the left is that of the section north or south, as the case may be, of the other base-line, 32° N. Each of these numbers divided by 12 gives the number of degrees from the corresponding base-line to the center of the section to which it refers. Thus the two numbers corresponding to each section locate its center exactly, and therefore all observations are located to within an error of 2.5. The position of a section is indicated in the text (Michael and McEwen, 1915, p. 46) by a section *number* giving the distance *west* of 114° W, accompanied by a *subscript* giving the distance *north* or an *exponent* giving the distance *south* of 32° N. Thus 40_4 defines the section which is the fortieth west of 114° W and the fourth north of 32° N, while 40^4 defines the section which is the fortieth *west* of 114° W and the fourth *south* of 32° N.

The number of observations, biological as well as hydrographic, made in each section prior to June, 1915, is approximately represented by stippling (pls. 1–3); hence these plates represent graphically the approximate number and distribution of observations throughout the whole area surveyed. Fully half of the observations are hydrographic.

2. Topography of the Ocean Bottom

Since it is desirable at the outset to have a general idea of the region explored, attention is first called to the contour maps (pls. 1–3) of the region which extends from Point Conception, 35° N, to Guadalupe and Cerros islands, 28° N. The contours were determined, for the most part, from soundings entered on the United States Coast and Geodetic Survey charts; but our own soundings (Michael and McEwen,

1915, pp. 127–132) were also used, especially in the region west of Los Coronados (or the Coronado Islands, pl. 4). Here our intensive explorations made possible a more detailed representation of the topography. Though but few soundings have been made more than ten miles off shore, it is improbable that future explorations will necessitate any important alteration of the contours.

The contour maps reveal the presence of numerous submerged valleys and other regions where the depth increases rapidly. In fact, depths exceeding a thousand meters are usually found within fifty miles of the coast, and depths exceeding five hundred meters occur in several regions within five miles of the coast. For a detailed discussion of the submerged valleys and other topographic features of the ocean bottom off California and Mexico, the reader is referred to Davidson (1897).

B. HORIZONTAL DISTRIBUTION OF TEMPERATURES AND SALINITIES

1. Surface Isotherms and Isohalines in Several Large Areas

(*a*) *Some general principles underlying oceanic circulation.*— Samples of ocean water taken at different times from the same position, or from different positions at the same time, usually differ in one or more respects, e.g., in temperature, salinity, gas content, etc. Such differences are of course due to variations in the wind, humidity of the air, solar radiation, etc., and to the flow of the water.

Furthermore, water having certain properties often flows as a current or slow drift into regions where the local conditions tend to produce different properties. For example, water flowing from a region where a certain intensity of solar radiation prevails into one of greater intensity is colder than the neighboring still water. And, in general, the presence at any place of water differing significantly in any property from that corresponding to local conditions indicates a flow of water from a region where different conditions prevail.

Any difference in the properties of the water that changes its density tends to give rise to a convective circulation. If acting alone, this circulation would result in a series of layers of water which, while increasing in density *in situ* with the depth, would not vary in density with respect to horizontal distances. In addition, there is

always the effect due to the much slower processes of conduction and diffusion, both of which tend to produce a state of homogeneity vertically as well as horizontally. While any type of circulation which mixes the water accelerates these equalizing processes, there are many factors, such as variation in solar radiation, condition of the air, etc., that have the opposite effect. Accordingly, the distribution of the various properties of sea-water may be exceedingly complex.

Finally, while the distribution of any one property of ocean water affords indirect information concerning its circulation, the combined evidence from more than one is still more valuable. Moreover, in some cases the distribution of several properties, such as temperature, salinity, and gas content, must be known in order to work out the circulation satisfactorily.

(*b*) *Methods employed in determining isotherms and isohalines.*—To determine the exact distribution of temperatures or salinities in a given area at a given time requires a large number of simultaneous observations well distributed throughout the area. On the basis of these observations lines of equal temperature or salinity can be drawn to represent the distribution at that time. All of our observations were made from one boat, and therefore could not be simultaneous. Moreover, they were not as well distributed as we wished, except in a few portions of the area. Nevertheless, an approximation to the average distribution of temperature and salinity during certain months could be worked out in some cases by averaging and interpolating. This has been done, and after applying a correction for the diurnal variation (see p. 271) the average of the values obtained during the particular month considered was computed for each section and was assumed to correspond to the position of its center. It is well to point out, therefore, that the effect of only those approximately continuous influences having, on the average, a tendency to produce fairly constant types of temperature and salinity distribution during the periods of observation are likely to be revealed by the isotherms or isohalines determined in this way.

(*c*) *Isotherms.*—The southward dip of the isotherms southeast of Santa Catalina Island (pls. 5 and 6) and southeast of San Clemente Island (pls. 7 and 8, figs. 7 and 8) reveals a southward flow of water, since lower temperatures are found in the vicinity of the portions of greatest curvature than either east or west of them. The source of this cold water will be considered later. Furthermore, the southerly drift thus revealed agrees, in general, with the average of direct current

observations made by officers cruising in the Pacific and represented on the U. S. Meteorological Charts of the North Pacific Ocean.

While this is the characteristic direction of surface drift, a local and more restricted northward drift of warm water is also shown near the mainland off Point Loma by plates 7 and 8.

The temperatures near the east coasts of the islands are higher than those farther from their shores, as shown off Catalina by plates 5 and 6 and off Guadalupe and Cerros islands by plate 9. This difference in temperatures would be expected because in a deep region, say exceeding two hundred meters, the heat received by any given layer of water is largely derived from the fraction of the solar radiation directly absorbed by that layer. In a shallow region, however, additional heat is communicated by convection and conduction from the bottom. Thus the heat is concentrated in a smaller volume in shallow than in deep water. Also the convection currents due to these high temperatures tend to produce high temperatures for some distance in all directions from the shallow region.

In contrast to the above results, numerous regions of shallow water off the mainland have lower temperatures than the water in their immediate vicinity. For example, in plate 9 two such regions are shown just south of Cape San Quentin, in one of which values as low as 13° C are found with a progressive increase in all directions, and in the other an area having the low temperature of 15° C is circumscribed by warmer water and the coast. Three other cold areas shown by the same plate are also surrounded by the coast and by warmer water. Plate 6 reveals the same phenomenon near Point Fermin and also north of Point Dume; while in Santa Monica Bay much higher temperatures prevail. Since, as was pointed out above, solar radiation would be expected to produce higher temperatures in areas of shallow water, there must be a flow of water from some colder region wherever the surface temperatures are so low. Evidently a surface flow will not account for these low temperatures, because several of these areas are completely circumscribed by the coast and water of a higher temperature. Upwelling of cold bottom water appears to be the only type of circulation that could produce such a distribution of temperatures.

Furthermore, the contour maps (pls. 1–3) reveal a striking correlation between the location of these areas of cold water and the submerged valleys or other regions in which the depth increases rapidly with increasing distance from the coast. For example, the

cold areas north of Point Dume (pl. 6) are close to two submerged valleys, as shown (pl. 1) by the one hundred and the five hundred meter contours. Again, the cold area between Point Fermin and Point Vicente (pl. 6) occurs where the five hundred meter line bends to within a mile of the coast (pl. 2). Likewise the areas of cold water shown by plate 9 occur where the five hundred meter contour runs close to the coast (pl. 3), while warm water occurs in the region of shallow water between Cerros Island and the mainland. Finally, the cold water southwest of San Clemente Island shown in plate 5 is associated with a rapid increase in depth from a few meters over the Cortes Bank (pl. 2) to 1500 meters at a distance of less than fifteen miles to the southwest.

However, since the relation thus revealed between the presence of areas of cold water and the bottom topography does not always hold, there must be other factors (see p. 277) that have an important influence on upwelling.

(*d*) *Isohalines.*—The southward dip of the isohalines southeast of Santa Catalina Island (pl. 10), southeast of San Clemente Island (pl. 11 and pl. 12, fig. 14), and off San Diego (pl. 11 and pl. 12, fig. 15) reveals a southward flow of water having a low salinity. In plate 10 the southward dip of the lines nearer the mainland shows a second but narrower southward current, while a flow to the southeast is indicated by plates 13 and 14, figure 19.

The prevailing southerly drift so clearly revealed by both temperatures and salinities is sometimes accompanied by a northward flow of water having a high salinity and restricted to a narrow belt bordering the mainland. Such a northward flow is revealed by the northward dip of the isohalines (pl. 12, figs. 14 and 16) and agrees with that already shown by the isotherms (see p. 260).

In contrast with this translation of water in some definite direction, the circumscribed areas of water having a high salinity northeast of San Clemente Island shown by plates 11 and 13 suggest a whirling motion. Since the island probably deflects the general southerly drift to the east and thus gives rise to a flow to the southeast bordering its coast, there would be a tendency to generate a whirling motion in a counter-clockwise direction. On the other hand, a current flowing southwest past the east point of the island would tend to generate a clockwise whirl. A whirling motion tends to separate the water near its center from the surrounding water and, by thus interfering with the convection currents, permits an increase in both salinity and tem-

perature above that of the surrounding water. Furthermore, the high temperatures of the same region, shown especially well by plate 7, confirm this hypothesis. A similar phenomenon is also indicated in Santa Monica Bay by plates 6 and 10, and the southwesterly flow revealed by the isotherms (pl. 6) would tend to produce a counter-clockwise whirl. The distribution of gas content would evidently be especially valuable in determining the details of such a complex circulation.

Several circumscribed areas of low salinity off the mainland are shown in plate 10; on comparing this with plate 6 the location of these areas of low salinity will be found to correspond with those areas of cold water heretofore discussed (see p. 260). Again, the low salinities off the Cortes Bank correspond to the low temperatures (pls. 5 and 13). These low surface salinities may seem at first to contradict the hypothesis of upwelling, since it is generally believed, as stated by Sumner (1914, p. 82), that "according to the theory of upwelling, we should expect to find water of a *higher* salinity, derived from the deeper parts of the ocean, in the immediate neighborhood of the western coast" [italics mine]. However, the effect of upwelling on the distribution of salinity is not as simple as it would on first thought appear. It depends mainly upon the vertical distribution of salinity and on the velocity of upwelling. As demonstrated on page 277, in any region characterized as this one is by a minimum salinity at some intermediate depth (see p. 272) and a very low velocity of upwelling (see p. 278), *lower* salinities would be expected in the upper levels. Hence the hypothesis of upwelling proposed to account for the low temperatures is well supported by the distribution of salinities.

However, as shown by plates 13 and 14, figure 19, high salinities sometimes occur inshore. The interaction of a number of local conditions which influence salinity, such as humidity and velocity of the air, temperature of the water, solar radiation, etc., may at times overcome the effects of upwelling, which depends largely upon the wind (see p. 277) and is therefore subject to wide variations. Water of low temperature and salinity may have its temperature increased by solar radiation, but the humidity of the air may be so high and its circulation so feeble that evaporation would be very slow and little if any increase in salinity could result. On the other hand, conditions favoring rapid evaporation and therefore high salinities may be associated with influences having little tendency to raise the temperature. In fact, an actual decrease in temperature might result from the tendency of

evaporation to cool the water. Hence such a complex distribution of temperature and salinity must often arise as to require other data before trustworthy conclusions relative to oceanic circulation can be reached. Again, we must not forget that the complexities indicated are due in part at least to errors of interpolation (see p. 259). For example, the oval area of warm water off the mainland near La Jolla, shown by plate 5, indicates the presence of a whirl, but (pl. 13) the salinities in the central part of the oval are low, although high ones would be expected if this water were comparatively stagnant. Again, the isotherms in plate 14, figure 18, indicate at the same location a similar whirl which is apparently contradicted by the corresponding isohalines (pl. 14, fig. 19).

On the whole, the isotherms and isohalines show an increase in temperature and salinity with a decrease in latitude, and afford strong evidence of a general southerly drift that at times is combined with a northerly current near the mainland. This southerly flow largely consists of water having low temperatures and salinities that are very probably due to upwelling of bottom water adjacent to the mainland. There is also evidence, although not as strong, of the presence of areas of whirling water whose central parts are comparatively stagnant.

2. Surface and Subsurface Isotherms and Isohalines West of the Coronado Islands

The large number of observations made in the region of Los Coronados (the Coronado Islands) justifies dividing that area into sections whose sides are one minute in length and representing in greater detail the distribution of temperature and salinity. The isotherms and isohalines which will be considered first are based on observations made in each of a series of depths during June, 1911. The shaded area of each figure represents a horizontal section of the land at the depth considered, i.e., the boundary of this area would be the shoreline if the water were lowered to the corresponding level.

(*a*) *Isotherms.*—The dip to the southwest of the surface isotherms in the upper part of plate 15, figure 20, and the presence of colder water along an area extending to the southwest from the islands are probably due to the junction of a southwesterly current of warm water, pointed out on page 259, with a westerly current of cold water. The isotherms at the depths 9, 18, and 27 meters (pls. 15–16, figs. 21–

23), reveal the same type of circulation in which however, the relative influence of the southerly drift decreases as the depth increases.

At the depth of eighteen meters an area of cold water is shown surrounded by warmer water and by the coast (pl. 16, fig. 22). A similar distribution of temperature is revealed at each of the five lower levels examined, namely 27, 37, 55, 64, and 92 meters (pls. 16–18, figs. 23–27). Such a distribution of temperature reveals either an upwelling of bottom water adjacent to the coast combined with a flow away from the coast, or an upwelling extending over nearly the whole area lying between two lines running southwest from the land. It has been shown that the former type of circulation characterizes the upper layers of water; therefore there must be a compensating circulation of the latter type in the deep water. Moreover, Ekman's theory (see p. 277) shows that the former type of circulation is usually confined to the upper fifty meters, and the latter type prevails from there to the bottom.

On the whole, there is a decrease in temperature at each level along lines converging to the western coasts of the islands. The decrease, however, is not so pronounced as would be expected under similar conditions off the mainland, because their short coast lines permit the intrusion of water at all levels.

The circumscribed areas of warm water shown off South Island by plate 15, figure 20, may be whirls formed by the junction of a southward drift of warm water between the islands and the westward drift of upwelling cold water. Similar areas of warm surface water are shown by plate 19, based upon observations made during May, 1914, and July, 1912.

(*b*) *Isohalines.*—The isohalines in plate 20 show the junction of a southward flow of the upper layers of water having a high salinity with a westward flow of water of low salinity derived from the upwelling next to the coast of South Island. A tendency of the two currents to form whirls is indicated by the circumscribed areas of high salinity in both depths.

The areas of salinities as low as $33.50^{o}/_{oo}$ at the depth of 27 meters (pl. 21, fig. 32), bounded by the coast and by water of a higher salinity, show upwelling; while the southward dip of the $33.60^{o}/_{oo}$ line at the north and the northward dip of the $33.66^{o}/_{oo}$ line at the south indicate an intrusion, along the borders of this area, of water having a higher salinity.

High salinities should border the western coasts in this upwelling

region at depths below about forty meters, as shown on page 277. Therefore the presence of circumscribed areas of high salinity adjacent to the island at the 55 and 92 meter levels (pls. 21 and 22, figs. 33 and 34), and the pronounced decrease in salinity as the distance from the coast increases, afford additional evidence of upwelling. A similar intrusion of water along the north and south borders, but having a low instead of a high salinity, is indicated in these depths by the dip in the bordering isohalines.

Plate 22, figure 35, shows a circumscribed area of water having a high salinity which corresponds to the area of warm water shown by plate 19, figure 28, and thus affords additional evidence in favor of a whirl.

C. RELATION OF TEMPERATURE AND SALINITY TO DISTANCE FROM THE COAST

From serial observations made at a selected number of positions along any straight line, isotherms and isohalines can be drawn in a vertical plane. From these isotherms and isohalines can be inferred the flow of water in a direction parallel to the plane.

1. Isotherms

The isotherms in plate 23, figure 36, are based upon serial observations of temperature made along a line twelve miles in length running perpendicularly to the contours from Point Dume. They show that the inshore temperatures are, on the whole, lower than those offshore. Furthermore, all of the lower isotherms bend upward as they approach the coast, thus revealing a flow of cold deep water toward the coast along lines approximately parallel to the bottom. Again, their greater upward deflection near the coast reveals a proportionately greater upward velocity of cold water there, although it is very small at all positions. Since this upwelling of deep water would necessarily result in a flow of cold water away from the coast in the upper levels, the figure ought to reveal, as it does, a rise in temperature in each of the upper levels as the distance from the coast increases. This rise in temperature would be expected to continue until the value corresponding to the "normal" is reached, i.e., that value corresponding to the local heating effect of the sun (see p. 258).

The peculiar downward dip of all the isotherms three miles from the shore may mean an intrusion of warmer water flowing parallel to the coast, as previously indicated (see p. 264), or it may be due to some other irregularity in the circulation, the cause of which can not readily be discussed here.

The results of a similar series of observations in a plane through a point three miles south of Point Loma and running perpendicularly to the contours are shown by plate 23, figure 37. The lower isotherms are approximately horizontal from the western portion over deep water to within three miles of the region of shallow water, where they are deflected upward. While the temperature of the upper levels does not decrease so rapidly toward the inshore position as in the case represented by plate 23, figure 36, a similar type of circulation is shown. The presence of the region of shallow water several miles in extent between the inshore position and the mainland would tend to reduce upwelling and thus to reduce the cooling effect. Moreover, the observations were begun at 7 in the morning at the offshore position, and the inshore position was not reached until 1 in the afternoon of the same day. Hence, as the work progressed, the effect of solar radiation in increasing the temperature masked that of upwelling.

2. Isohalines

The isohalines shown by plate 24, figure 38, are based on a series of salinity observations corresponding to the temperatures shown by plate 23, figure 36. The upward trend of the lower isohalines corroborates the evidence derived from the isotherms, of an inshore flow of deep water which is deflected upward as the coast is approached. The lines corresponding to $33.50‰$ and $33.45‰$ reveal an inward flow below forty meters and an outward flow above that depth. The salinities at the upper levels are low inshore; and as the distance from the coast increases they approach the higher value corresponding to local conditions beyond the region of upwelling.

The isohalines shown by plate 24, figure 39, which correspond to the isotherms of plate 23, figure 37, reveal again the same type of circulation. The large area of shallow water between the mainland and this inshore position probably accounts for the high surface salinities near the latter area. The high salinities half-way between the offshore and inshore positions are probably due to the order in which the observations were made, as stated above.

D. PERIODIC VARIATIONS IN TEMPERATURE AND SALINITY

1. Seasonal Variations

Owing to the prevailing variations in temperature and salinity with respect to position, observations made in a deep-water region of small area but little affected by upwelling and well distributed throughout each year afford the most satisfactory basis for a study of periodic temperature and salinity variations. Our observations made in sections 40_4, 40_5, 40_6, 41_4, 41_5, and 41_6, eight miles off the Coronado Islands, though not numerous during each month of any one year, meet the requirements better than those made in any other region. Accordingly, these observations, supplemented by those made off the Coronado pier in section 38_8, and by "normal" values for the Pacific at this latitude, are employed for this purpose.

The mean monthly surface temperature of the ocean corresponding to an average year within the period from 1908 to 1915 is shown by plate 25, figure 40. This curve agrees well with that based on supplementary observations made off the pier at Coronado Beach (pl. 25, fig. 41), where, owing to the large area of shallow water and the gentle slope of the bottom, the average reduction in temperature due to upwelling is also small.[1] These monthly temperatures are from one to two degrees lower than the "normal" for the Pacific Ocean at the same latitude, as revealed by comparison with plate 25, figure 42, representing the temperatures a thousand miles west of San Diego, as shown by the monthly isotherms of the North Pacific (Thorade, 1909). Plate 25, figure 42, shows further that the "normal" annual range is 7° C, from a minimum of 15° C in March or April to a maximum of 22° C in August, while off the Coronado Islands (pl. 25, fig. 40) the annual range is 6°.2 C, from a minimum of 14°.3 C in February to a maximum of 20°.5 C in August.

Off the Coronado Islands (pl. 25, fig. 43) the mean monthly salinity has an annual range of $0.25^0/_{00}$, from a minimum of $33.50^0/_{00}$ in February to a maximum of $33.75^0/_{00}$ in July or August. These values are somewhat lower than those found off Coronado Beach, where (pl. 25, fig. 44) the minimum is $33.55^0/_{00}$ in January and the maximum is $33.85^0/_{00}$ in July or August.

[1] On some days the temperatures off Coronado Beach are as low as those found at any of the upwelling regions, but such cases are exceptional.

The average seasonal variation in temperature at all depths less than five hundred meters during the period from 1908 to 1915 is shown by plate 26, figure 45. This, together with plate 25, figure 40, shows that the month of minimum temperature varies from February at the surface to May at depths exceeding thirty meters, and that the month of maximum temperature varies from August at the surface to November at depths exceeding fifty meters. It also shows that the annual range in temperature decreases from 6°2 C at the surface to 1°0 C at two hundred meters, while it can scarcely be detected below four hundred meters.

The average seasonal variation in salinity at all depths less than five hundred meters is shown by plate 26, figure 46. Though salinity data are very deficient for October, November, December, and January, and are less complete than the temperature data for the remaining months, certain general facts can be inferred. At the surface (see also pl. 25, fig. 43) the minimum salinity occurs in February and the maximum in July or August. At 25 meters a minimum annual range of 0.15‰ is shown. Below 75 meters the maximum occurs in April, and the minimum in November; while the annual range at 150 meters approximates to 0.25‰, the range at the surface. Below 400 meters the annual range can scarcely be detected. The peculiar dip of all isohalines below 50 meters between May and July is very likely due to a difference in years rather than months.

The distribution of temperature and salinity is very different in spring, when the increasing solar radiation tends to raise the temperature and salinity, from that in autumn, when because of the decreasing solar radiation the water tends to cool. In fact, there is a characteristic distribution of temperature and salinity for each month which is revealed in detail by plates 27–32.

The surface temperature of Glorietta Bight, a shallow inlet of San Diego Bay near Coronado Beach, well removed from direct influences of the main tidal currents, has an annual range of 10° C, from a minimum of 14° C in January to a maximum of 24° C in July or August (pl. 33, fig. 92). The corresponding surface salinity (pl. 33, fig. 91) has an annual range of 1.73‰, seven times greater than in the ocean. It varies from a minimum of 33.67‰ in February to a maximum of 35.40‰ in July. Temperature observations made in the central portion of the bay reveal an annual range (pl. 33, fig. 93) of 9°7 C from a minimum of 12°8 C in January to a maximum of 22°5 C in August.

Both temperature and salinity observations in San Diego Bay give widely different results, depending upon the state of the tide and the position of the observations; the values generally increase as the tide falls and as the distance from the entrance increases. For example, at low tide on July 18, 1908, at 8 in the morning, the temperature and salinity near the central part of the bay were 20°.8 C and 34.71‰ respectively; four hours later, during high tide, at the same place the values were reduced to 18°.0 C and 34.04‰ respectively. During the same month temperatures as high as 27°.07 C and salinities as high as 36.50‰ were observed in the shallow water off National City, eight miles from the harbor entrance, while at the entrance itself the values were approximately 19°.0 C and 33.75‰.

Our hydrographic observations both in San Diego Bay and in the ocean demonstrate that, while the monthly averages of temperature and salinity at any given position show the same general type of seasonal variation, each year is distinct from the others. In fact, averages for each of the several different months have actually differed from those for the same months of other years by amounts comparable with the annual range. Compare especially figure 50 with 51 (pl. 27), figure 62 with 63 (pl. 29), and figure 66 with 68 (pl. 30).

Again, we have not infrequently found significant differences in temperature and salinity corresponding to different days of the same month at a given position, even ten miles or more from shore. For example, on June 25, 1909, four surface temperatures were observed at 32° 52′ N and 117° 30′ W between 17°.6 C and 17°.7 C, while three days later, at the same position and time of day, three temperatures were observed between 19°.0 C and 19°.2 C. The corresponding salinities were between 33.63‰ and 33.65‰ on the first day, while on the last day they were between 33.68‰ and 33.81‰. Moreover, large differences may occur at approximately the same time and within a distance of two or three miles of each other, even in regions well removed from land and over deep water. For example, on July 11, 1908, midway between San Clemente Island and the Cortes Bank, the surface temperature was 17°.2 C and the salinity 33.75‰; twenty minutes later and two miles farther from San Clemente the temperature was 15°.4 C and the salinity 33.84‰.

Nearer shore there are still greater irregularities. For example, on July 25, 1912, about half a mile southeast of South Coronado Island, temperatures *simultaneously observed at positions less than sixty feet apart* differed by 1°.5 C; the first was 19°.7 C and the second 21°.2 C.

Moreover, this is not an isolated case; similar differences have been repeatedly observed (Michael and McEwen, 1915, table I, water-samples 3329–30, 3369–70, and 3377–78).

These facts emphasize the necessity of fairly continuous and numerous observations *at each position*. They *demonstrate* that even a very crude approximation toward a biological or planktonic "census of the sea" can be obtained, if at all, only from a vast number of simultaneous observations well distributed throughout the region to which the census refers. Even granting that plankton is "uniformly distributed" if "physical conditions" are uniform, the *main* errors can not, as intimated by Johnstone (1908, pp. 119–121), be eliminated by refinement of apparatus. The employment of nets whose filtration "constants" are known even to within an infinitesimal quantity can not eliminate the effects of unavoidable variation in temperature and salinity, not to mention those of other environmental elements.

2. Mean Annual Values

The average of a large number of observations of temperature or salinity well distributed throughout each year of a given period is required for an exact determination of the mean annual temperature or salinity corresponding to that period. If the observations are not well distributed or if they are missing for certain months, the simple average of the observations will usually give an erroneous estimate. However, by means of graphical interpolation, as shown by plate 26, figures 45 and 46, approximate estimates can be made of the true values for each month of what corresponds to an average year of the period, and the average of these results is the best approximation to the mean annual temperature or salinity that can be obtained from the data. The relation of the mean annual temperature to depth shown by plate 34 and the corresponding salinity relation shown by plate 35 were determined in this way from plate 26. The extreme monthly averages indicated by the dotted lines were also determined from the same curves. Since little if any seasonal variation in temperature or salinity occurs below four hundred meters, the simple average of all values observed at each of these depths was plotted, and the curves (pl. 36, figs. 96–97) drawn through the points representing the observed values give the relation between the mean annual temperature and salinity to depth, in the interval from four hundred to fourteen hundred meters.

3. Diurnal Variation

In the same region (eight miles west of the Coronado Islands) the diurnal range in surface temperature is about 1°.0 C. The minimum temperature occurs between 1 and 2 in the morning and the maximum between 5 and 7 in the afternoon. Between 10 and 11 in the morning and 10 and 11 at night the temperature is approximately the same as the average for a twenty-four hour interval. The maximum occurs about sixteen hours after the preceding minimum and about eight hours before the following minimum.

An empirical law of diurnal variation in surface temperature based on a large number of observations may be used for correcting a temperature observed at any hour approximately to its value corresponding to any other hour. For example, adding to an observed temperature the correction entered in the following table gives its most probable value at 10 A.M.

TABLE 1

Corrections to Surface Temperature Observations to Give Their Most Probable Values at 10 A.M.

	Time of observation							
	A.M.				P.M.			
	0–3	3–6	6–9	9–12	12–3	3–6	6–9	9–12
Correction	+0°.45	+0°.40	+0°.30	0°.00	−0°.25	−0°.45	−0°.40	0°.00

Diurnal variation decreases in magnitude as the depth increases; and at depths exceeding twenty-five meters it is not indicated at all by our data. Furthermore, the observations we have made do not justify computing a table of corrections for any level but the surface.

While a small diurnal variation (about $0.05^{o}/_{oo}$) in surface salinity is indicated by our data, it is apparently more complicated than that of the temperature, and our observations are not adapted to determining its law.

E. THE THERMOCLINE AND ACCOMPANYING SALINITY DISTRIBUTION

The temperature usually decreases continually as the depth increases and our observations have never revealed a "reversal," i.e., an increase in temperature with an increase in depth.[2] The depth-interval in which the temperature changes most rapidly with the depth is called the "thermocline." The water in this interval forms a transition layer or boundary separating two masses of water of very different temperatures. During the summer months, from May to September inclusive, the thermocline is near the surface and the rate of temperature change, 0°.16 C per meter, is comparatively rapid; while during the winter months, from October to April, it occurs at a greater depth, and the rate of change is only 0°.07 C per meter (pl. 26, fig. 45).

In August the thermocline is usually between 5 and 25 meters and the rate of change, 0°.30 C per meter, is greater than during any other month, while in February it occurs between 25 and 100 meters, and the rate of change, 0°.05 C per meter, is smaller than during any other month (pl. 36, fig. 98).

The distribution of salinity with respect to depth is closely correlated with the temperature distribution. During August, when the thermocline is most pronounced, the salinity decreases most rapidly to a *minimum* at about 30 meters and increases from there to the bottom, while during December, January, and February, when the temperature in the upper 50 meters decreases very slowly with respect to the depth, the salinity is nearly constant, though a minimum is indicated at 30 meters (pl. 37, fig. 99).

The existence of a minimum salinity between 20 and 60 meters, at least in the region from Point Conception to the Coronado Islands, is established beyond doubt, since it is clearly revealed by the monthly average values (pls. 29–32), as well as by nearly all of the numerous individual series of observations. A few such series are presented in the following table.

[2] A few such cases have been indicated, but proved to be due to errors.

TABLE II

SEVEN SELECTED SERIES OF SALINITY OBSERVATIONS REVEALING A SUBSURFACE MINIMUM

Water sample 1606–1620 Aug. 16, 1910 Section 41_5		Water sample 2207–2230 June 22, 1911 Section 42_{10}		Water sample 2681–2701 Aug. 10, 1911 Section 40_4		Water sample 2837–2844 Aug. 12, 1911 Section 40_6		Water sample 4282–4298 Aug. 7, 1913 Section 62_{25}		Water sample 4468–4485 Aug. 9, 1913 Section 58_{23}		Water sample 4518–4533 Aug. 10, 1913 Section 53_{21}	
Depth in meters	Salinity per mille	Depth in meters	Salinity per mille	Depth in meters	Salinity per mille	Depth in meters	Salinity per mille	Depth in meters	Salinity per mille	Depth in meters	Salinity per mille	Depth in meters	Salinity per mille
0	33.65	0	33.75	0	33.63	0	33.70	0	33.60	0	33.70	0	33.64
0	33.71	0	33.68	0	33.76	9	33.48	5	33.58	0	33.67	0	33.62
0	33.73	5	33.65	4	33.44	18	33.49	7	33.59	5	33.62	5	33.58
10	33.71	7	33.65	5	33.59	27	33.40	10	33.57	7	33.64	7	33.37
20	33.48	9	33.68	7	33.60	37	33.38	12	33.57	10	33.58	10	33.40
30	33.43	13	33.68	9	33.61	55	33.50	15	33.53	12	33.54	12	33.50
50	33.52	16	33.58	11	33.64	92	33.60	17	33.57	15	33.57	15	33.50
75	33.71	18	33.58	18	33.47	185	33.94	20	33.55	17	33.57	17	33.50
125	33.81	22	33.60	23	33.43	365	34.25	25	33.53	20	33.53	20	33.50
225	34.06	27	33.54	27	33.43	.....	.....	30	33.50	25	33.50	25	33.49
.....	.....	37	33.52	37	33.52	.....	.....	40	33.45	30	33.50	30	33.52
.....	.....	37	33.54	46	33.43	.....	.....	50	33.45	40	33.51	40	33.53
.....	.....	46	33.53	55	33.44	.....	.....	60	33.60	50	33.51	50	33.60
.....	.....	46	33.53	64	33.52	.....	.....	75	33.69	60	33.49	60	33.60
.....	.....	64	33.64	92	33.63	.....	.....	150	33.95	75	33.57	75	33.68
.....	.....	73	33.70	110	33.71	.....	.....	.....	.....	100	33.71	100	33.79
.....	.....	82	33.83	137	33.94	.....	.....	.....	.....	150	33.93	.....	...
.....	.....	92	33.69	.....	.....	.....	.....	.....	.....	200	34.09	.....	...
.....	...	110	33.94	...	...	...	...	...	...	...	...	...	...
...	...	137	33.93	...	...	...	...	...	...	...	...	...	...

While the minimum is most pronounced in August, it is clearly revealed in every month except November, December, January, and February, and in these winter months the salinity of the upper 30 meters does not increase as the depth increases. In the winter months the salinity at depths above 200 meters is less than during any other time of the year, and there is a continual increase from about 30 meters to the bottom. The prevailing depth of the minimum in deep-water regions is between 20 and 60 meters, but as the coast is approached it occurs nearer the surface.

In general, the conditions necessary for the production of such a minimum are probably limited to certain parts of the ocean as well as to certain seasons. In most expeditions too few observations have been made in the upper hundred meters to determine whether such a minimum existed or not. In fact, our own observations made prior to the summer of 1910, while indicating a minimum, were too far apart to establish its presence, and the small number of low salinities ob-

served below the surface were thought to be due to erroneous determinations. It was only after we began making observations with the Ekman reversing water bottles at short intervals of five meters or less between the surface and one hundred meters that we became convinced of the presence of a subsurface minimum. Finally, these results demonstrate the need of more intensive observations in the upper hundred meters of other regions.

F. CERTAIN THEORETICAL IMPLICATIONS OF THE OBSERVATIONS

In general, our temperature observations made at all levels off the west coasts of the mainland and the islands reveal an increase in temperature as the distance from the coast increases. Furthermore, our observations of salinity made at all levels above the depth of its minimum value (see p. 272), which varies from sixty meters in deep to less than ten in shallow water, show that on the average the water adjacent to the coast has the lowest salinity. That is, in this upper mass of water the salinity varies in the same general way as the temperature, though not as regularly. Again, at all levels below the depth of minimum salinity the highest salinities occur adjacent to the coast, and there is a fairly regular decrease as the distance from the coast increases.

The presence of cold water has been repeatedly observed in various coastal regions. In order to account for this phenomenon some hypothesis involving the upwelling of deep water into these regions has been proposed by several investigators; as revealed in the preceding pages, there is strong evidence in favor of such a circulation off the California coast.

An upwelling of deep cold water would evidently reduce the temperature at any higher level and would also tend to maintain the salinity in the upper levels at a value below the normal, if the rate of upwelling is not too great. The reason for this is as follows: Since sea-water is a dilute solution of various salts, its osmotic pressure varies as the product of its concentration or salinity, by its absolute temperature. As shown by the following table, this product is nearly constant at all depths below that corresponding to the depth of minimum salinity, but increases from there to the surface. Therefore the osmotic pressure must be essentially constant below this depth, but

TABLE III

RELATION BETWEEN DEPTH AND THE PRODUCT OF ABSOLUTE TEMPERATURE AND SALINITY

Based on a single series of observations made in section 40_1 on August 11, 1911				Based on the mean annual temperature and salinity as shown by plates 42, 43, and 44			
Depth in meters	Absolute temperature	Salinity	Product	Depth in meters	Absolute temperature	Salinity	Product
0	293.40	33.81	9915	0	290.0	33.66	9760
0	293.50	33.66	9880	10	289.7	33.58	9730
0	293.15	33.68	9870	20	288.2	33.54	9665
9	293.20	33.60	9850	30	287.2	33.53	9630
14	290.40	33.54	9740	40	286.1	33.55	9600
18	289.90	33.53	9720	50	285.5	33.57	9585
23	288.40	33.76	9735	60	285.0	33.61	9580
37	286.90	33.57	9630	70	284.6	33.66	9580
46	285.25	33.50	9555	80	284.3	33.71	9585
55	284.50	33.50	9530	90	284.0	33.73	9585
73	283.95	33.57	9530	100	283.8	33.79	9590
92	283.40	33.65	9535	150	282.9	34.01	9620
275	282.20	34.00	9595	200	282.3	34.16	9645
550	279.45	34.14	9540	400	280.5	34.31	9625
1235	277.05	34.42	9535	600	279.1	34.36	9590
				800	278.0	34.40	9565

owing to evaporation at the surface it increases progressively toward the surface. Thus such a high concentration is maintained at the surface that there is continual diffusion of salts toward the bottom

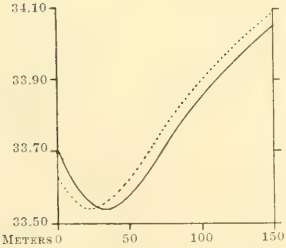

Fig. A. Diagram to illustrate the effect of upwelling on the vertical distribution of salinity.

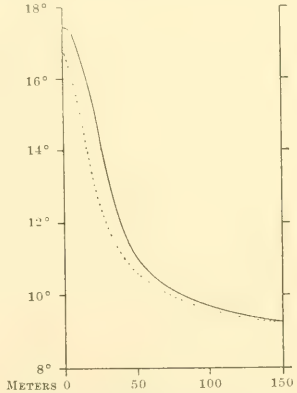

Fig. B. Diagram to illustrate the effect of upwelling on the vertical distribution of temperature.

water. Imagine these processes of evaporation, absorption of solar radiation, convection, and diffusion to take place during brief time-intervals alternating with other intervals during which the entire column of water is slightly elevated. Because of the relation of temperature and salinity to depth in the region from Point Conception to the Coronado Islands (see pp. 272 to 274), which relation is shown diagrammatically by text-figures A and B (full lines), the elevation of the entire column would result in a lower temperature at all levels, a lower salinity at each level above that of its minimum value, and a higher salinity at each level below that depth (text-figs. A and B, dotted lines). During the next interval when the column of water remained stationary the former processes of absorption, evaporation, and diffusion would tend to produce the relations represented by the full lines, and so on.

The absorption of solar radiation which tends to heat the water is accompanied by the processes of evaporation and convection which tend to cool it. If these opposing influences are not balanced, the temperature must change. For example, if the heat lost because of evaporation and convection is less than that absorbed from solar radiation the temperature will rise. But as it rises the rate of loss of heat will increase; and if the heat due to the absorption of solar radiation is gained at a constant rate, the temperature will ultimately increase until the heat lost equals that gained.

Now, in order to deduce the effect of upwelling, let us suppose a whole column of water is moved upward a small distance during a brief time-interval, and that these processes of heating, evaporation, etc., take place during the next interval, and so on. The temperature in each part of the column will then be reduced during the intervals when the column is moved upward, and raised during the other intervals. But, in order that the temperature may rise during the intervals of absorption, the actual temperature must be below the normal. Therefore such a temperature will finally be reached that its increase during the intervals of absorption will equal its decrease during the intervals of upward motion; that is, a "steady state" will arise in which the temperature is less than it would have been had the column of water not been elevated.

Similarly, the process of evaporation, which increases the salinity, is accompanied by the opposing processes of convection and diffusion, and if the rate of evaporation remains constant, a constant value of the salinity will finally be reached. Imagine the above processes of

heating, evaporation, etc., to take place during brief intervals of time alternating with intervals during which the column is elevated. During the intervals of elevation the salinity will be reduced at all depths above that of its minimum value, and raised at all greater depths, but during the other intervals it will be raised at all depths above that of its minimum value and lowered at all greater depths. Hence, as was shown to be true of temperatures, a steady state must ultimately arise in which the salinity is lower above the depth of its minimum value but is higher below that depth. If, as is the case in nature, the alternating time-intervals be indefinitely reduced until all processes occur simultaneously, the final temperature and salinity distribution will be unaltered.

The conclusion just reached regarding the effect of upwelling on the salinity holds only when other local conditions tend to produce a minimum value at some intermediate depth, and when the vertical velocities are not too great. In the absence of such a minimum value of the salinity or in case the upwelling is sufficiently active, high salinities would be expected at all depths of inshore regions.

By applying Ekman's hydrodynamical theory of oceanic circulation to observations other than of temperature and salinity made off the west coast of North America, the conclusion (McEwen, 1912) was reached that there must be an upwelling of deep water along the coast from 40° N to about 25° N. An important principle deduced by Ekman is that a wind blowing parallel to a coast will not only move the water in its own direction but will deflect a surface layer of less than one hundred meters in thickness to the right of its own direction. Hence a wind blowing in the proper direction with respect to a coast will remove the surface water and thus reduce the water pressure at all distances from the bottom. This reduction of pressure will then give rise to a flow of bottom water toward the coast, and consequently to the surface near the coast. By considering quantitatively the relation between wind velocities and the mean monthly surface temperatures between the west coast of North America and 140° W[3] the wind velocity was demonstrated to be an important if not the main cause of upwelling (McEwen, 1912). It also follows from Ekman's theory that the greater the inclination of the bottom, in the neighborhood of a coast, the narrower will be the belt near the coast into which a given volume of bottom water intrudes, and therefore the greater will be the

[3] See U. S. Meteorological Charts of the North Pacific (1908–1911) for data on the winds, and Thorade (1909) for the temperature distribution.

reduction of temperature and salinity in the upper levels. This deduction is strikingly verified by the observations discussed on pages 260 and 262.

Other theoretical investigations, not yet published, not only confirm the above conclusions but afford estimates of several other quantities measured as well as unmeasured. For example, a theoretical result which has not been checked directly is shown by the diagrammatic representation of the vertical circulation (text-fig. C). Adjacent stream lines include one-tenth (0.1) of the total volume of water flowing upward, and next to the coast, where the distance between the stream lines is a minimum, the vertical velocity is a maxi-

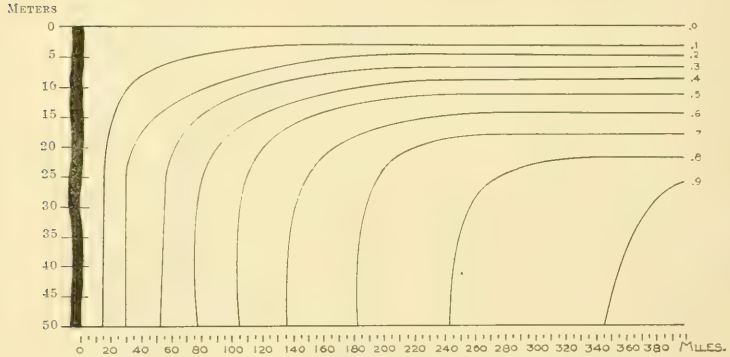

Fig. C

mum which, according to theoretical results based on observations made prior to 1915, could not have averaged more than one hundred meters per month. The actual stream lines are, of course, not parallel to the plane of the diagram because of the horizontal flow parallel to the coast.

Again, the amount of solar radiation absorbed per meter of seawater was deduced from the distribution of temperatures in the Pacific Ocean represented on Thorade's (1909) charts and from our own temperature observations. The resulting relation of the intensity of radiation to depth is expressed by the formula

$$(1)\quad I = Ae^{-0.0654z}$$

where I is the intensity at the depth z meters, A is the intensity at

the surface, and e is the Naperian base, 2.718. The values computed from this formula agree well with the results of photographic observations made in the Atlantic Ocean (Grien, 1913). Since direct observations of the intensity of light have not been made in the water of the San Diego region, the diagram (pl. 38, fig. 100) has been included in this paper in order to give the best approximation possible without direct measurement. It gives the average distribution of relative light intensities with respect to depth and the time of day, and is based on the above formula and an empirical one representing approximately the results of observations on the diurnal variation in the intensity of solar radiation on a horizontal surface at sea-level, between 20° N and 40° N. This formula is

$$(2)\quad I = 455 + 380\cos\frac{\pi t}{12} + 165\cos\frac{\pi t}{6}$$

where I is the intensity at the depth of one meter, in arbitrary units, and t is the time in hours measured from noon. Corresponding to these units formula (1) becomes

$$(3)\quad I = 1067e^{-0.06542}.$$

In a later paper a detailed account of the unpublished investigations referred to above will be presented.

I wish to express my thanks to Mr. E. L. Michael for his valuable suggestions relative to the preparation of the manuscript.

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La Jolla, California.

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EXPLANATION OF PLATES

PLATE 1

Fig. 1. Topography of ocean bottom, and approximate number and distribution of observations.

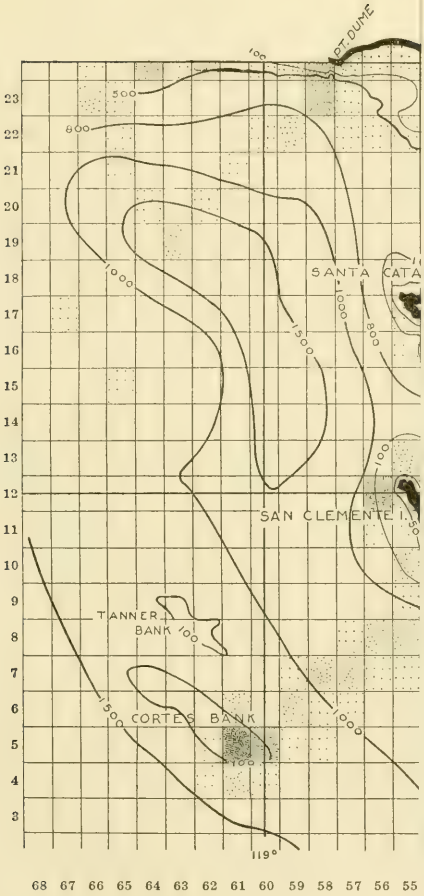
SYMBOL
NUMBER OF OBSERVATIONS PER SECTION
0
1-5
6-20
21-75
100
SAN MIGUEL I.
100
SANTA ROSA I.
SANTA CRUZ I.
ANACAPA
PT. DUME.
500
1000
1500
34°
120°
119°

Fig. 1

PLATE 2

Fig. 2. Topography of ocean bottom, and approximate number and distribution of observations.

Since the "sections" chosen for the ocean are too large to reveal adequately the distribution of observations made in San Diego and False (Mission) bays, these bays are left blank, although approximately four hundred hydrographic observations were made in the former and forty in the latter.


PT. DUME
100
500
600
1000
1500
SANTA CATA
1000
800
100
SAN CLEMENTE I.
50
TANNER
BANK 100
1500
CORTES BANK
1000
100
119°
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
68 67 66 65 64 63 62 61 60 59 58 57 56 55

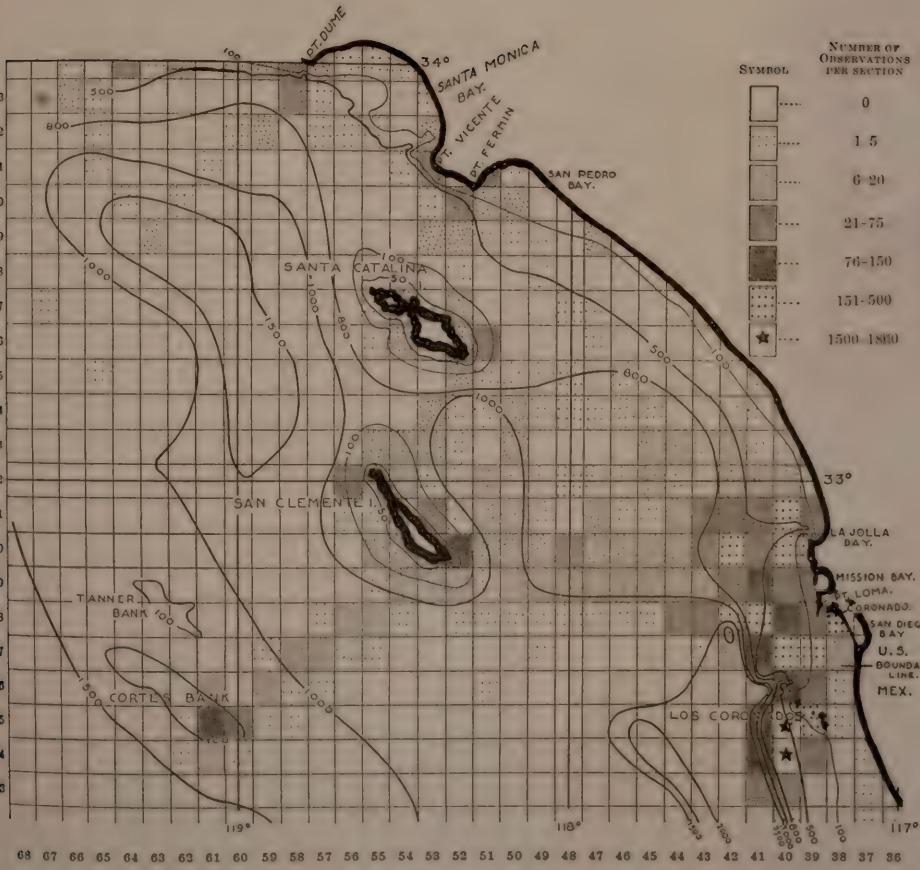

PT. DUNE
34°
SANTA MONICA BAY.
T. VICENTE
PT. FERMIN
SAN PEDRO BAY.
SANTA CATALINA I.
SAN CLEMENTE I.
TANNER BANK
CORTES BANK
LOS CORONADOS
33°
LA JOLLA BAY.
MISSION BAY.
PT. LOMA.
CORONADO.
SAN DIEGO BAY
U. S. BOUNDARY LINE.
MEX.
119°
118°
117°
SYMBOL
NUMBER OF OBSERVATIONS PER SECTION
0
1-5
6-20
21-75
76-150
151-500
1500-1800

Fig. 2

PLATE 3

Fig. 3. Topography of ocean bottom, and approximate number and distribution of observations.

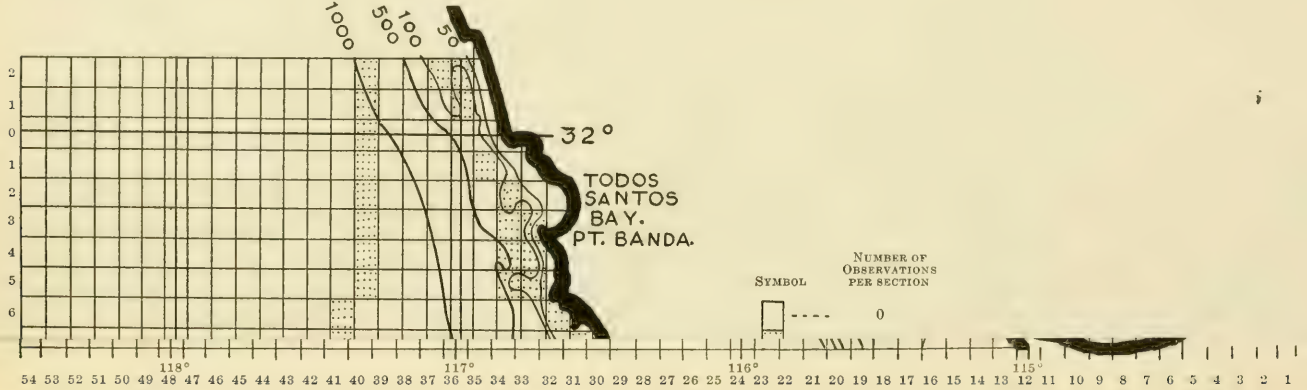

1000
500
100
50
32°
TODOS
SANTOS
BAY.
PT. BANDA.
SYMBOL
NUMBER OF OBSERVATIONS PER SECTION
0
2 1 0 1 2 3 4 5 6
118° 117° 116° 115°
54 53 52 51 50 49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

Fig. 3

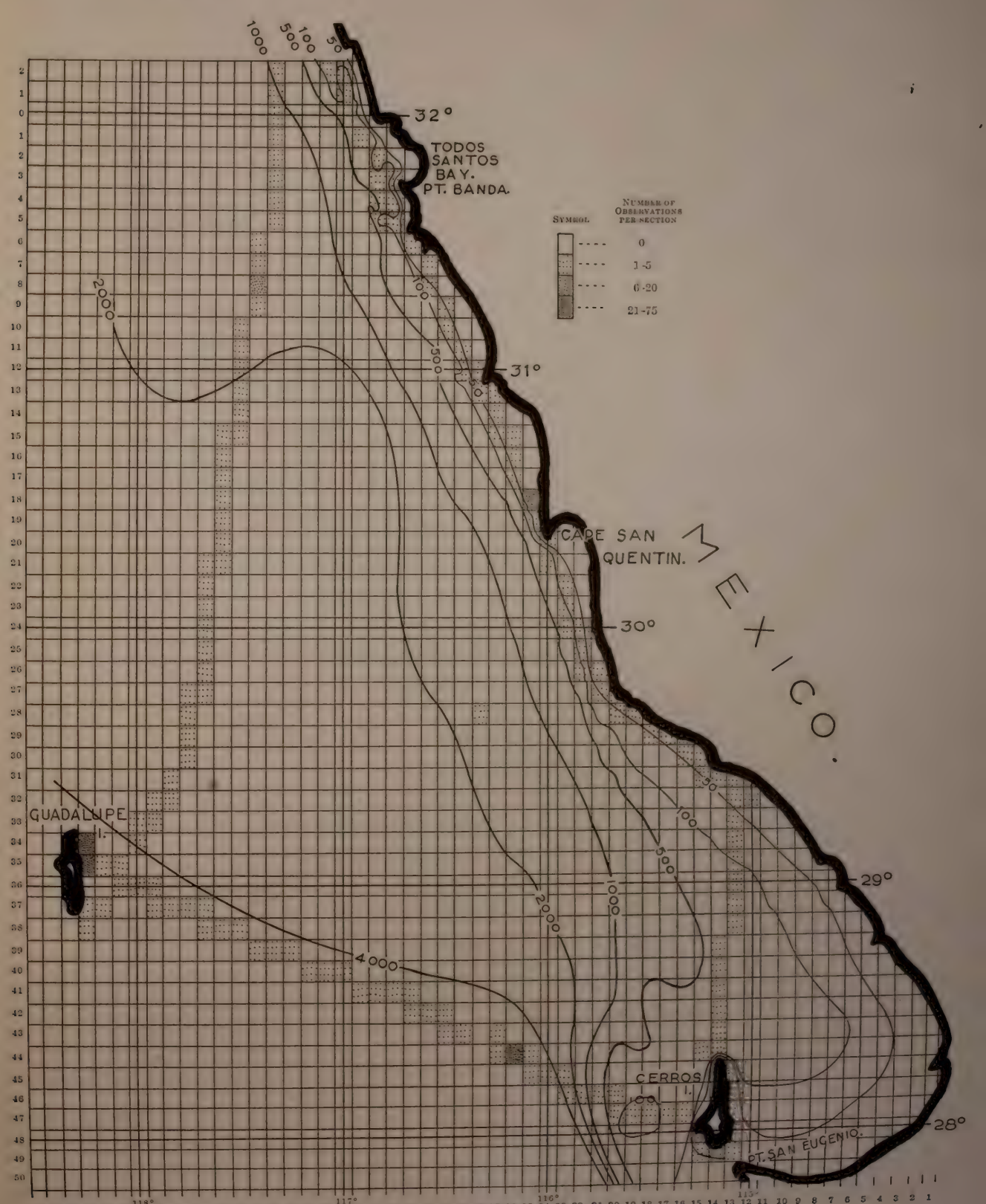

1000
500
100
50
32°
TODOS SANTOS BAY.
PT. BANDA.
SYMBOL
NUMBER OF OBSERVATIONS PER SECTION
0
1-5
6-20
21-75
200
100
50
31°
CAPE SAN QUENTIN.
MEXICO.
30°
GUADALUPE I.
100
50
29°
1000
2000
4000
CERROS I.
100
28°
PT. SAN EUGENIO.
118°
117°
116°
115°

Fig. 3

PLATE 4

Fig. 4. Topography of ocean bottom in a small region west of Los Coronados (the Coronado Islands).

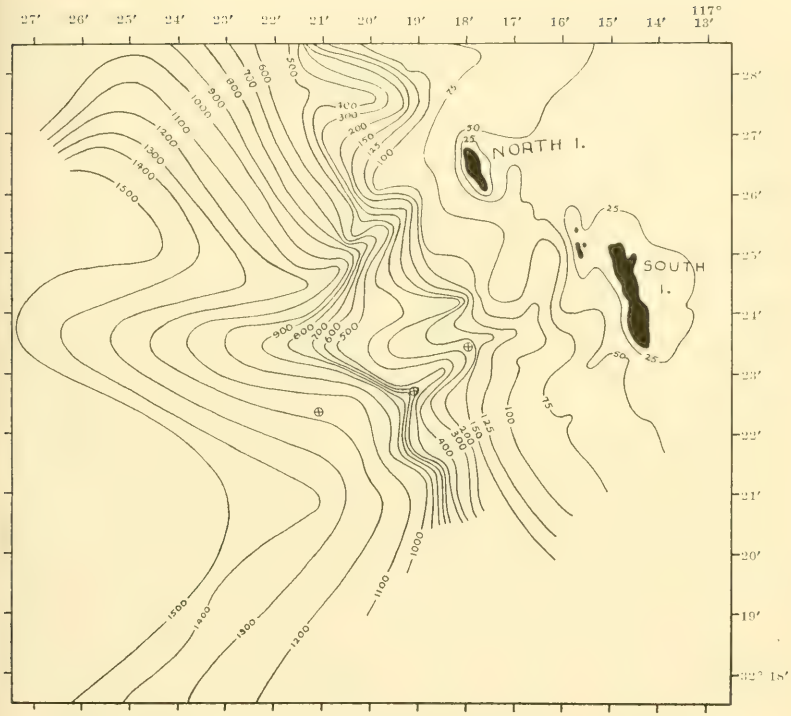

27′ 26′ 25′ 24′ 23′ 22′ 21′ 20′ 19′ 18′ 17′ 16′ 15′ 14′ 13′
117°
28′
27′
26′
25′
24′
23′
22′
21′
20′
19′
32° 18′
NORTH I.
SOUTH I.
500
600
700
800
900
1000
1100
1200
1300
1400
1500
100
75
50
25
125
150
200
300
400

Fig. 4

PLATE 5

Fig. 5. Surface isotherms for July, 1908.

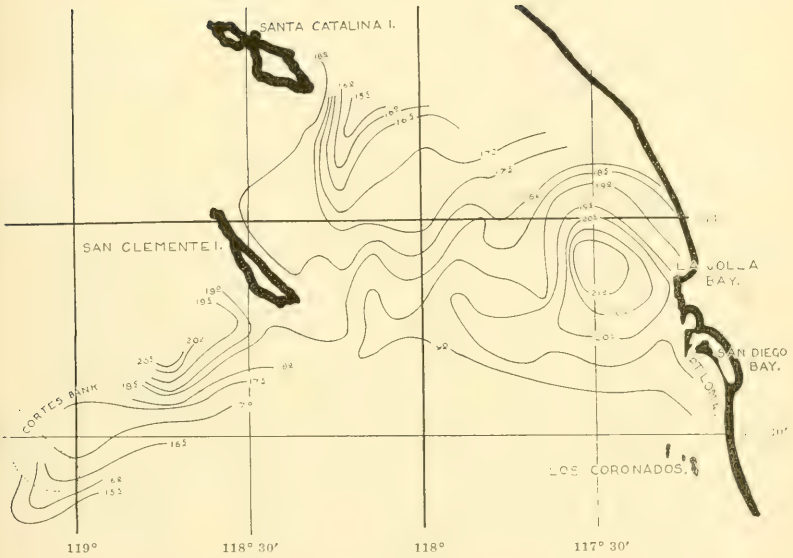

SANTA CATALINA I.
SAN CLEMENTE I.
LA JOLLA BAY.
SAN DIEGO BAY.
CORTES BANK
LOS CORONADOS.
119°
118° 30′
118°
117° 30′

Fig. 5

PLATE 6

Fig. 6. Surface isotherms for August, 1913.

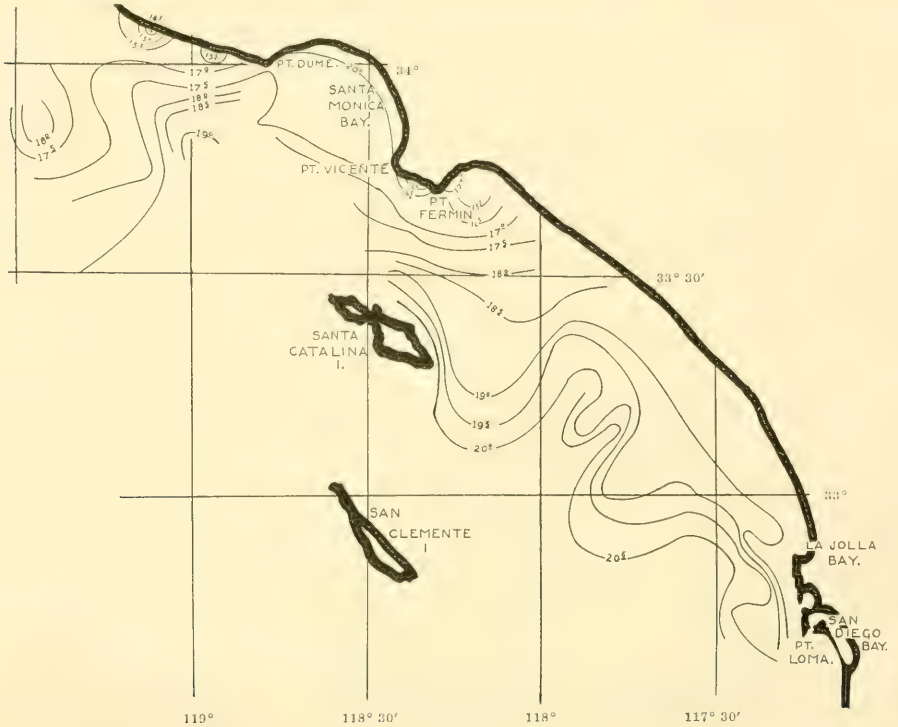

PT. DUME
34°
SANTA MONICA BAY.
PT. VICENTE
PT. FERMIN
33° 30'
SANTA CATALINA I.
SAN CLEMENTE I
33°
LA JOLLA BAY.
SAN DIEGO BAY.
PT. LOMA.
119°
118° 30'
118°
117° 30'

Fig. 6

PLATE 7

Fig. 7. Surface isotherms for June, 1911.

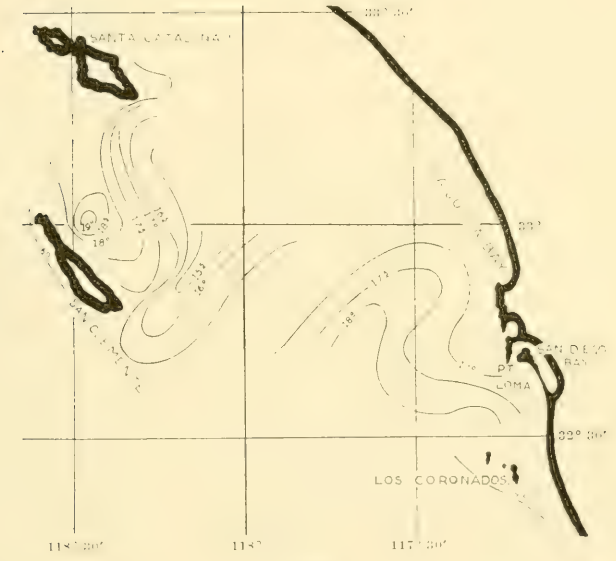

SANTA CATALINA I.
SAN CLEMENTE I.
SAN DIEGO BAY
PT. LOMA
LOS CORONADOS
33° 30'
33°
32° 30'
118° 30'
118°
117° 30'

Fig. 7

PLATE 8

Fig. 8. Surface isotherms for July, 1909.

Fig. 9. Surface isotherms for February, 1909.

Fig. 10. Surface isotherms for September, 1909.

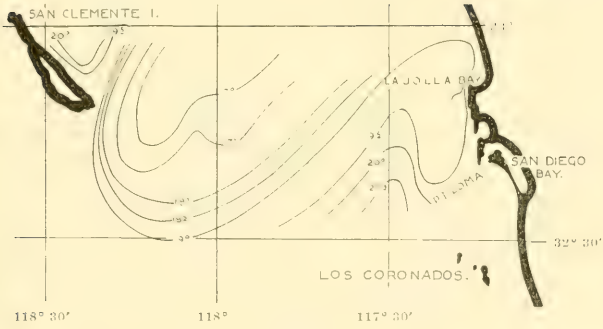


Fig. 8

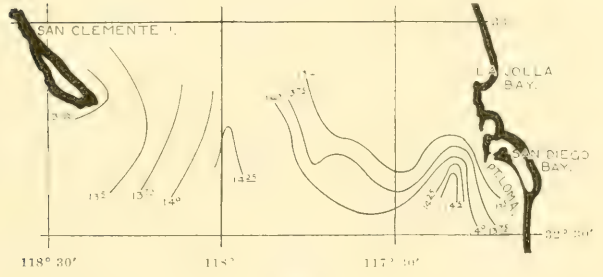


Fig. 9

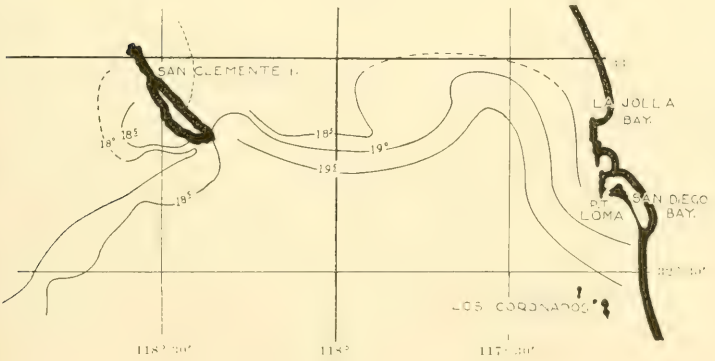


Fig. 10

PLATE 9

Fig. 11. Surface isotherms for August and September, 1908.

SAN DIEGO BAY.
U.S. BOUNDARY LINE.
TODOS SANTOS BAY.
PT. BANDA.
MEXICO
CAPE SAN QUENTIN
GUADALUPE I.
CERROS I.
PT. SAN EUGENIO
32°
31°
30°
29°
28°
115°
116°
117°

Fig. 11

PLATE 10

Fig. 12. Surface isohalines for August, 1913.

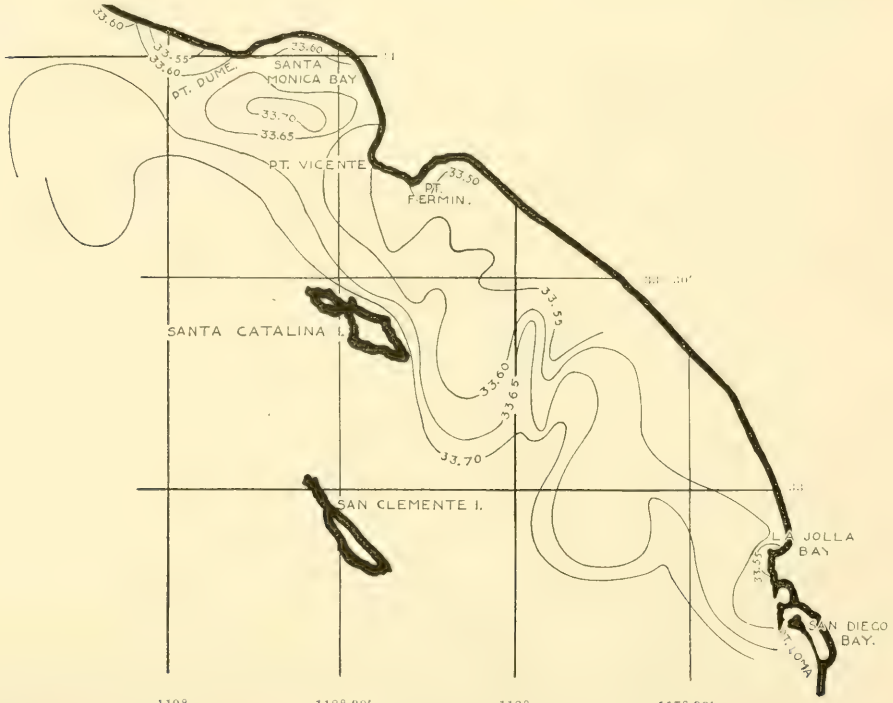

33.60
33.55
33.60
PT. DUME
SANTA MONICA BAY
33.60
33.70
33.65
PT. VICENTE
33.50
PT. FERMIN.
SANTA CATALINA I.
33.55
33.60
33.65
33.70
SAN CLEMENTE I.
JOLLA BAY
33.55
SAN DIEGO BAY.
119°
118° 30'
118°
117° 30'

Fig. 12

PLATE 11

Fig. 13. Surface isohalines for June, 1911.

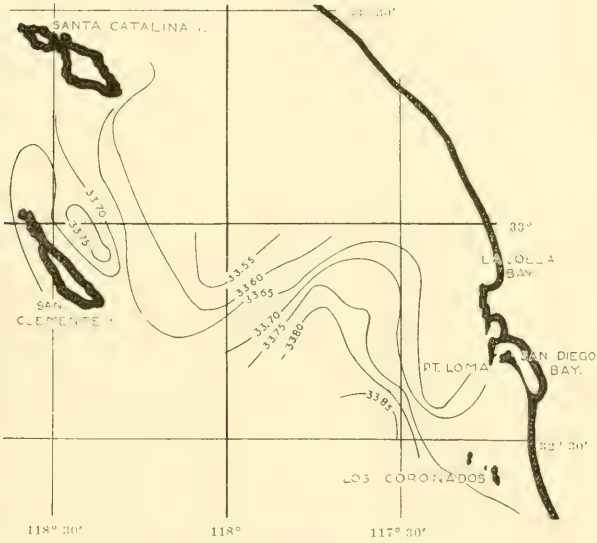

SANTA CATALINA I.
SAN CLEMENTE I.
33.70
33.75
33.55
33.60
33.65
33.70
33.75
33.80
33.85
LA JOLLA BAY
PT. LOMA
SAN DIEGO BAY.
LOS CORONADOS
33°
32° 30'
118° 30'
118°
117° 30'

Fig. 13

PLATE 12

Fig. 14. Surface isohalines for July, 1909.

Fig. 15. Surface isohalines for February, 1909.

Fig. 16. Surface isohalines for September, 1909.

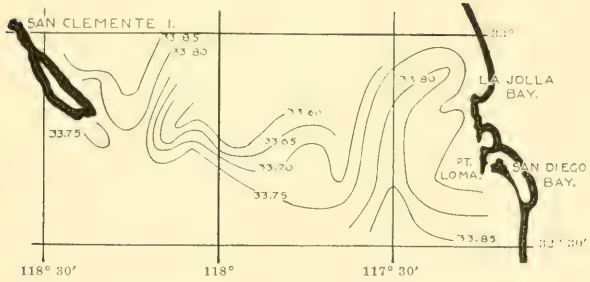


Fig. 14

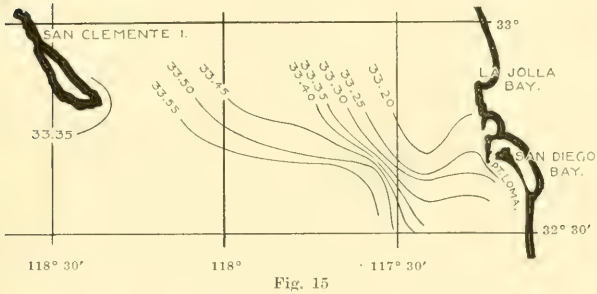


Fig. 15

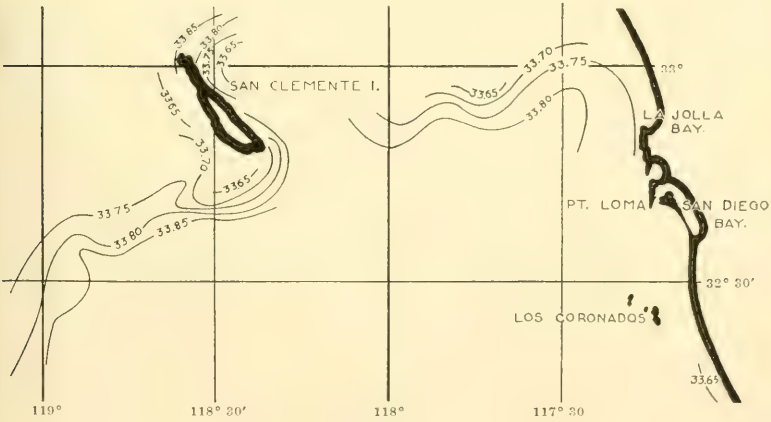


Fig. 16

PLATE 13

Fig. 17. Surface isohalines for July, 1908.

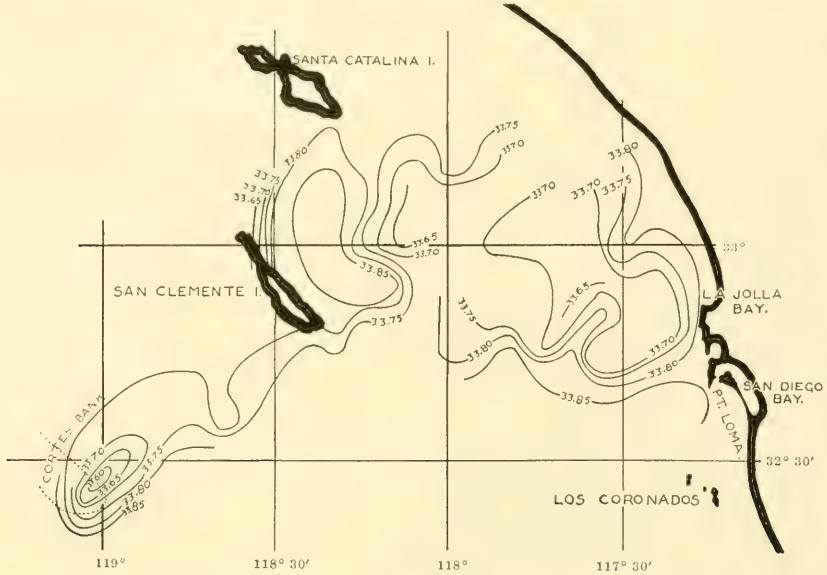

SANTA CATALINA I.
SAN CLEMENTE I.
CORTES BANK
LA JOLLA BAY.
SAN DIEGO BAY.
PT. LOMA
LOS CORONADOS
33.75
33.70
33.80
33.65
33.85
33.60
33°
32° 30'
119°
118° 30'
118°
117° 30'

Fig. 17

PLATE 14

Fig. 18. Surface isotherms for June, 1908.
Fig. 19. Surface isohalines for June, 1908.

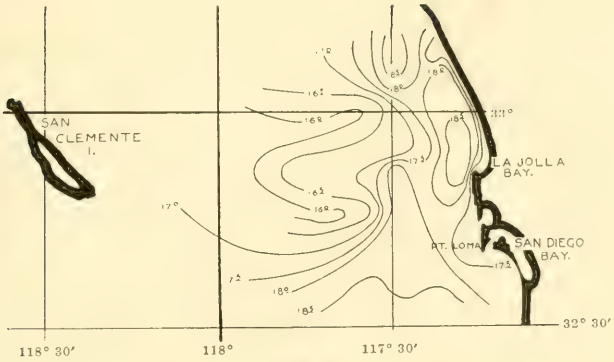

SAN CLEMENTE I.
LA JOLLA BAY.
PT. LOMA
SAN DIEGO BAY.
32° 30′
118° 30′
118°
117° 30′

Fig. 18

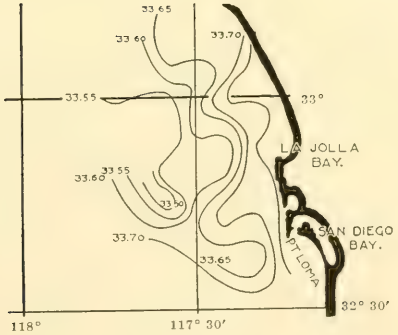

33.65
33.60
33.70
33.55
33°
LA JOLLA BAY.
33.60
33.55
33.50
33.70
33.65
SAN DIEGO BAY.
PT. LOMA
32° 30′
118°
117° 30′

Fig. 19

PLATE 15

Fig. 20. Surface isotherms of the Coronado Island region for June, 1911.

Fig. 21. Isotherms at depth 9 meters, in the Coronado Island region for June, 1911.

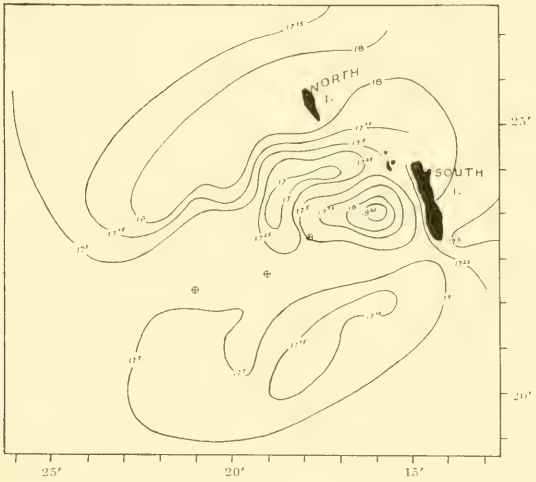


Fig. 20

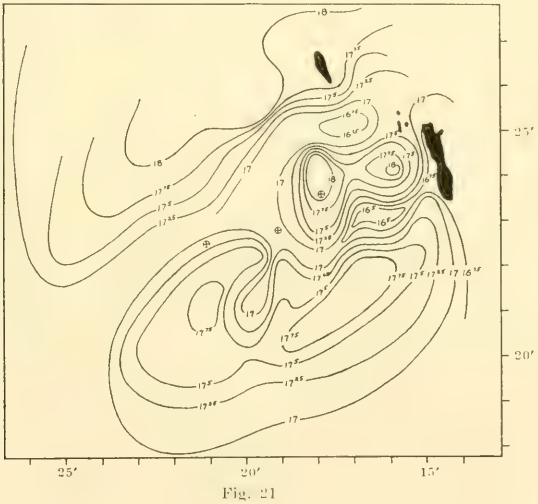


Fig. 21

PLATE 16

Fig. 22. Isotherms at depth 18 meters, in the Coronado Island region for June, 1911.

Fig. 23. Isotherms at depth 27 meters, in the Coronado Island region, for June, 1911.

Land at the level of the observations is indicated by diagonal cross-hatching in plates 16, 17, 18, 21, and 22.

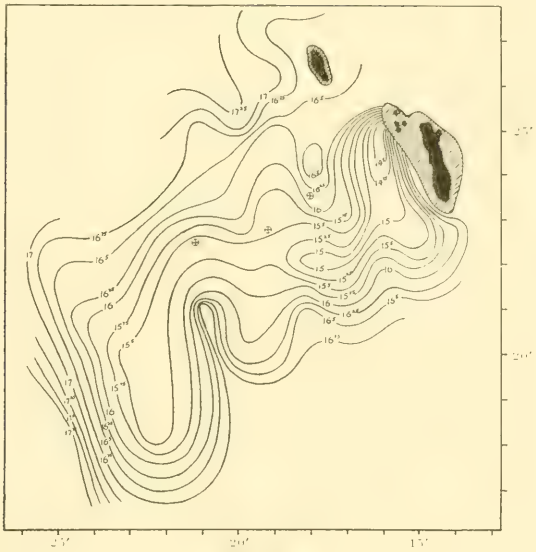


Fig. 22

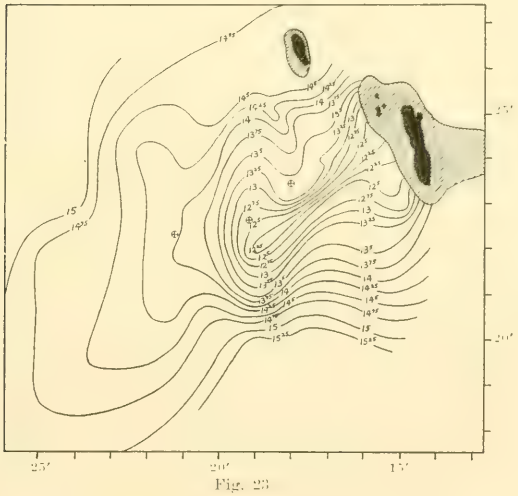


Fig. 23

PLATE 17

Fig. 24. Isotherms at depth 37 meters, in the Coronado Island region for June, 1911.

Fig. 25. Isotherms at depth 55 meters, in the Coronado Island region for June, 1911.

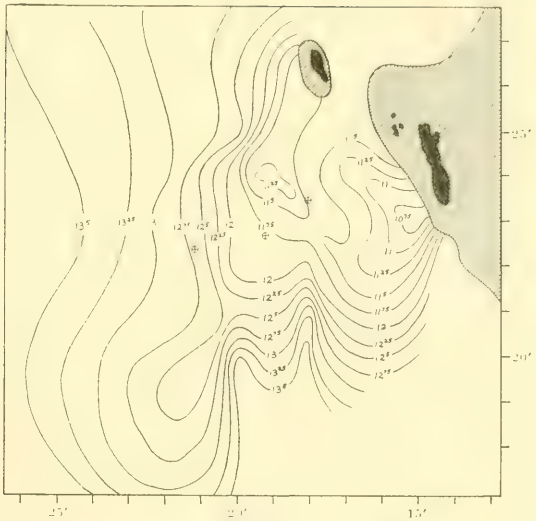


Fig. 24

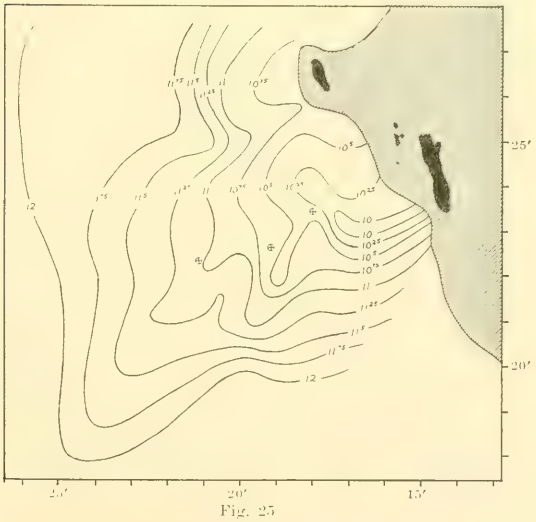


Fig. 25

PLATE 18

Fig. 26. Isotherms at depth 64 meters, in the Coronado Island region for June, 1911.

Fig. 27. Isotherms at depth 92 meters, in the Coronado Island region for June, 1911.

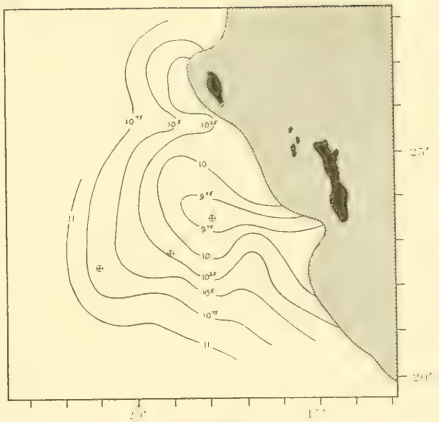

10.7
10.5
10.4
10
9.8
9.7
10
10.2
10.3
10.6
10.7
11
25'
20'
25'
17'

Fig. 26

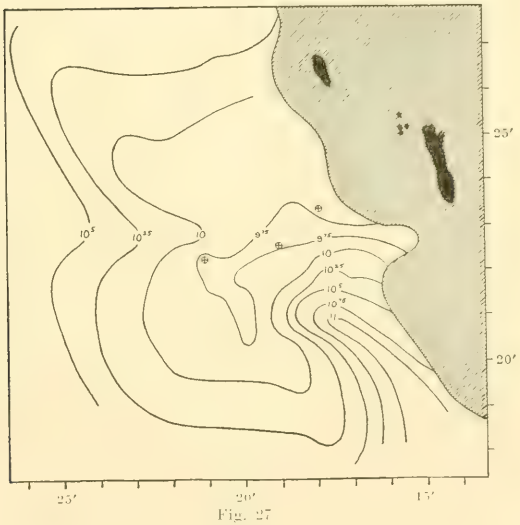

10.5
10.25
10
9.75
9.75
10
10.25
10.5
10.6
11
25'
20'
25'
20'
17'

Fig. 27

PLATE 19

Fig. 28. Surface isotherms of the Coronado Island region for May, 1914.

Fig. 29. Surface isotherms of the Coronado Island region for July, 1912.

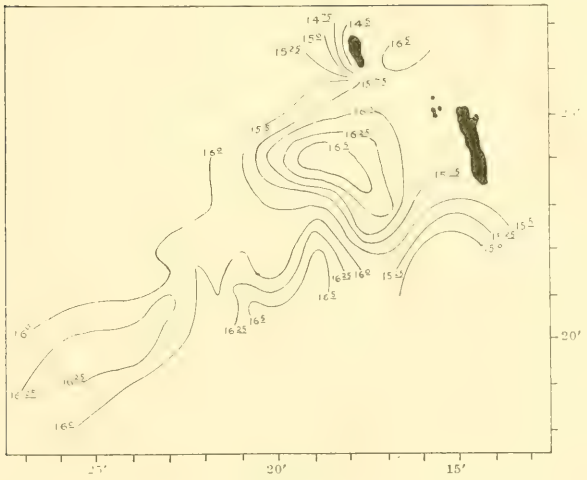


Fig. 28

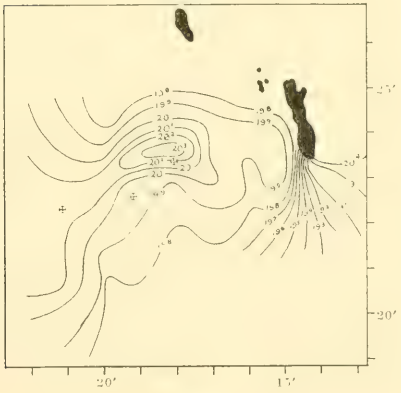


Fig. 29

PLATE 20

Fig. 30. Surface isohalines of the Coronado Island region for June, 1911.

NOTE.—The decimal part of the salinity is indicated for each isohaline in plates 20–22, but to save space the 33. is omitted.

Fig. 31. Isohalines at depth 9 meters, in the Coronado Island region for June, 1911.

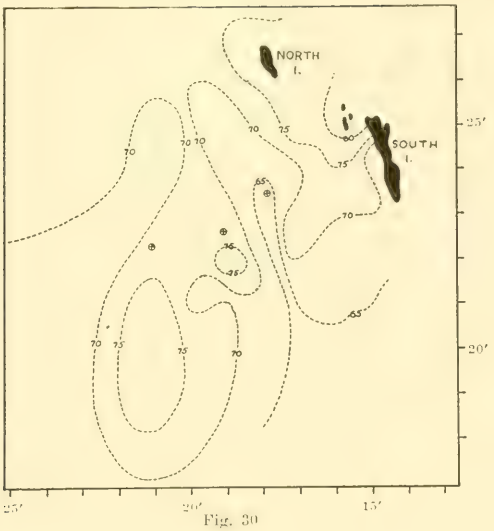


Fig. 30

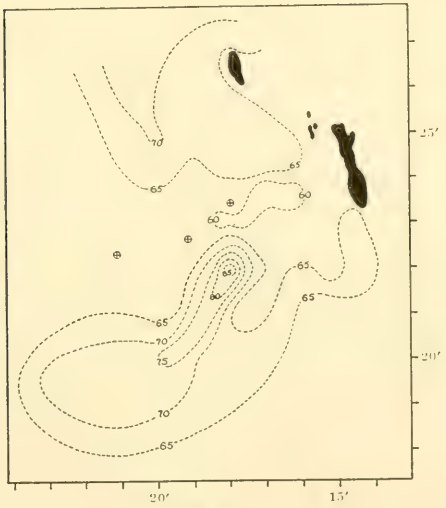


Fig. 31

PLATE 21

Fig. 32. Isohalines at depth 27 meters, in the Coronado Island region for June, 1911.

Fig. 33. Isohalines at depth 55 meters, in the Coronado Island region for June, 1911.

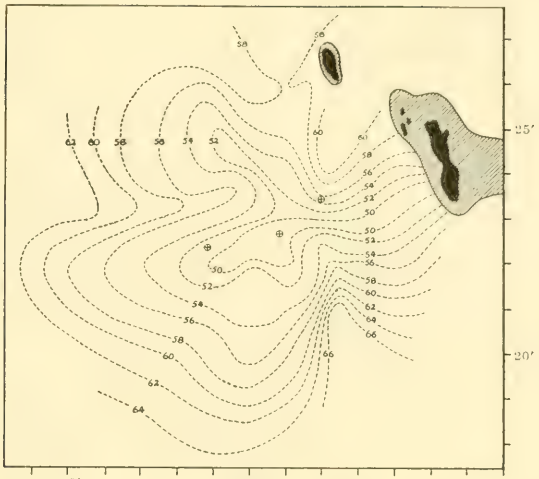


Fig. 32

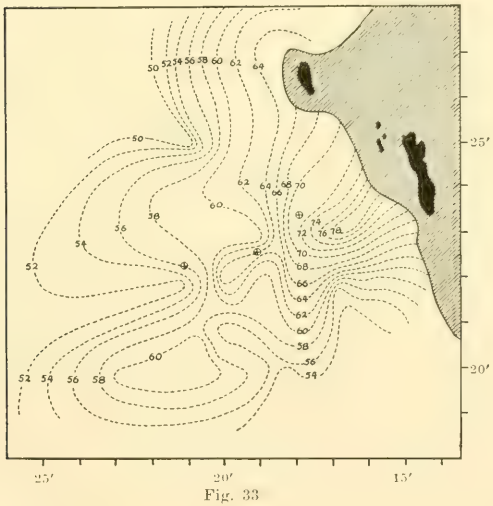


Fig. 33

PLATE 22

Fig. 34. Isohalines at depth 92 meters, in the Coronado Island region for June, 1911.

Fig. 35. Surface isohalines of the Coronado Island region for May, 1914.

25′
20′
20′
15′
56
58
70
72
74
76
78
80
82
84
74
76
78
80
82

Fig. 34

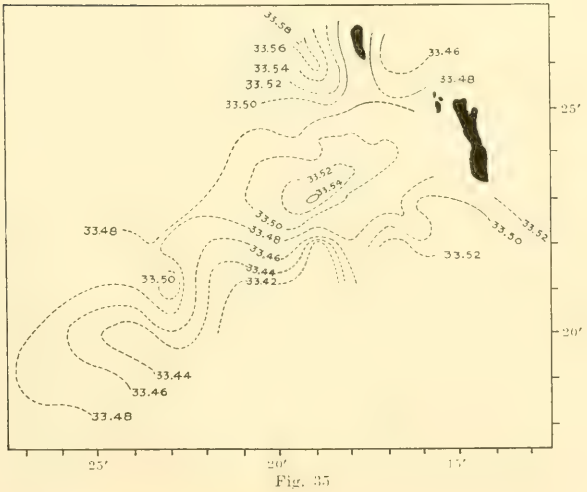

33.58
33.56
33.54
33.52
33.50
33.46
33.48
25′
20′
25′
20′
15′
33.52
33.54
33.50
33.48
33.46
33.44
33.42
33.50
33.52
33.48
33.50
33.52
33.44
33.46
33.48

Fig. 35

PLATE 23

Fig. 36. Distribution of temperatures in a vertical plane perpendicular to the contours through Point Dume.

Fig. 37. Distribution of temperatures in a vertical plane perpendicular to the contours from a point three miles south of Point Loma.

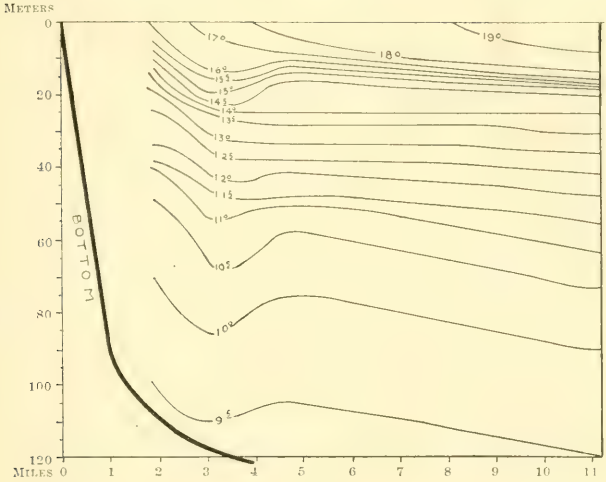

METERS
0
20
40
60
80
100
120
MILES 0 1 2 3 4 5 6 7 8 9 10 11
BOTTOM
17°
18°
19°
16°
15.5°
15°
14.5°
14°
13.5°
13°
12.5°
12°
11.5°
11°
10.5°
10°
9.5°

Fig. 36

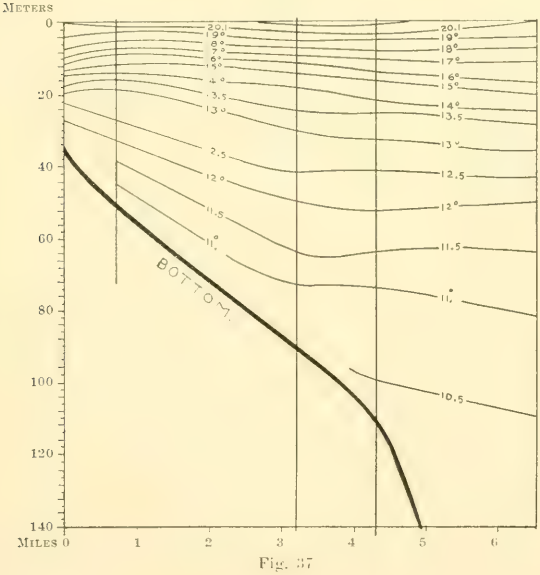

METERS
0
20
40
60
80
100
120
140
MILES 0 1 2 3 4 5 6
BOTTOM
20.1°
19°
18°
17°
16°
15°
14°
13.5°
13°
12.5°
12°
11.5°
11°
10.5°

Fig. 37

PLATE 24

Fig. 38. Distribution of salinity in a vertical plane perpendicular to the contours through Point Dume.

Fig. 39. Distribution of salinity in a vertical plane perpendicular to the contours through a point three miles south of Point Loma.

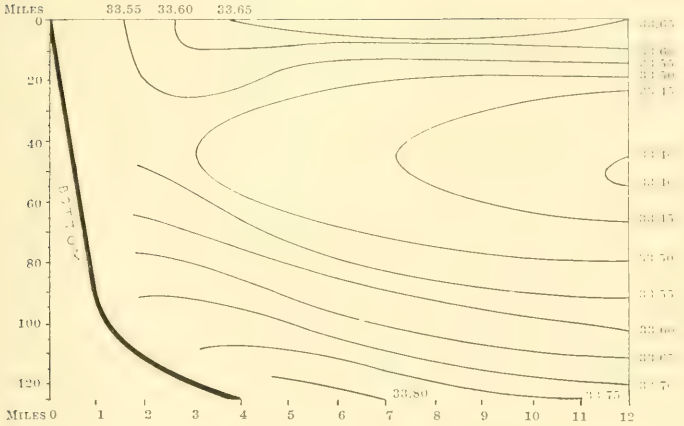

MILES
33.55 33.60 33.65
0
20
40
60
80
100
120
BOTTOM
33.80
MILES 0 1 2 3 4 5 6 7 8 9 10 11 12

Fig. 38

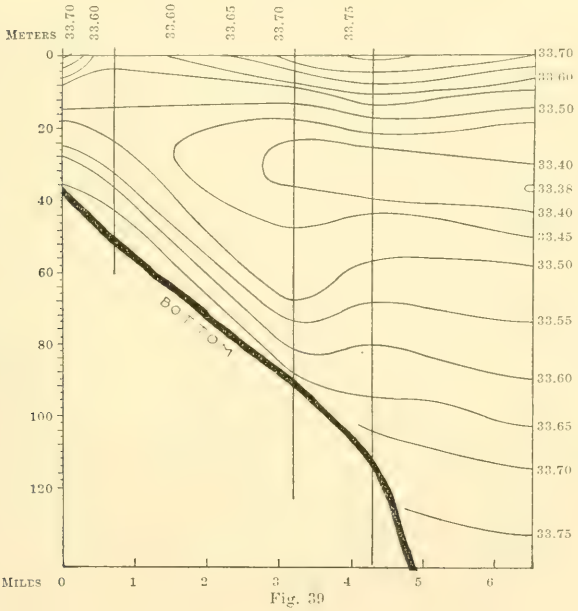

METERS
33.70 33.60 33.60 33.65 33.70 33.75
0
20
40
60
80
100
120
BOTTOM
33.70
33.60
33.50
33.40
33.38
33.40
33.45
33.50
33.55
33.60
33.65
33.70
33.75
MILES 0 1 2 3 4 5 6

Fig. 39

PLATE 23

Fig. 40. Seasonal variation in surface temperatures based on observations made approximately eight miles west of South Coronado Island in sections 40_4, 40_5, 40_6, 41_4, 41_5, and 41_6.

Fig. 41. Seasonal variation in surface temperature based on observations made off Coronado Beach in section 38_8.

Fig. 42. Approximate average seasonal variation in the "normal" surface temperature of the North Pacific Ocean at 32° 30' N.

Fig. 43. Seasonal variation in surface salinity, based on observations made approximately eight miles west of South Coronado Island in sections 40_4, 40_5, 40_6, 41_4, 41_5, and 41_6.

Fig. 44. Seasonal variation in surface salinity, based on observations made off Coronado Beach in section 38_8.

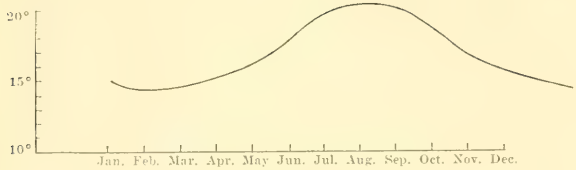


Fig. 40

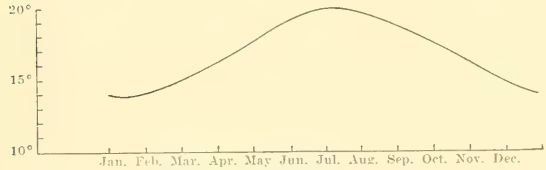


Fig. 41

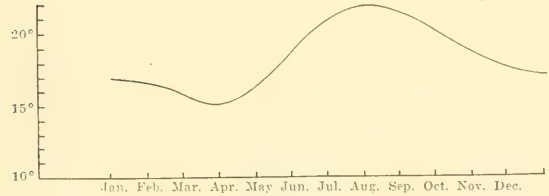


Fig. 42

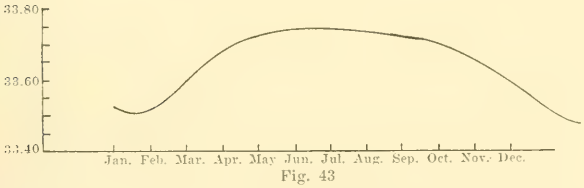


Fig. 43

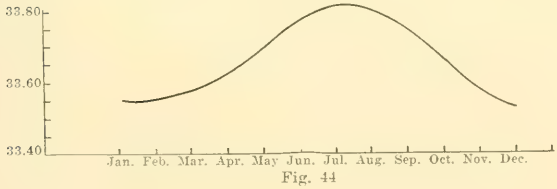


Fig. 44

PLATE 26

Fig. 45. Seasonal variation in temperature at all depths in a region approximately eight miles west of South Coronado Island in sections 40_4, 40_5, 40_6, 41_4, 41_5 and 41_6.

Fig. 46. Seasonal variation in salinity at all depths in a region approximately eight miles west of South Coronado Island in sections 40_4, 40_5, 40_6, 41_4, 41_5, and 41_6.

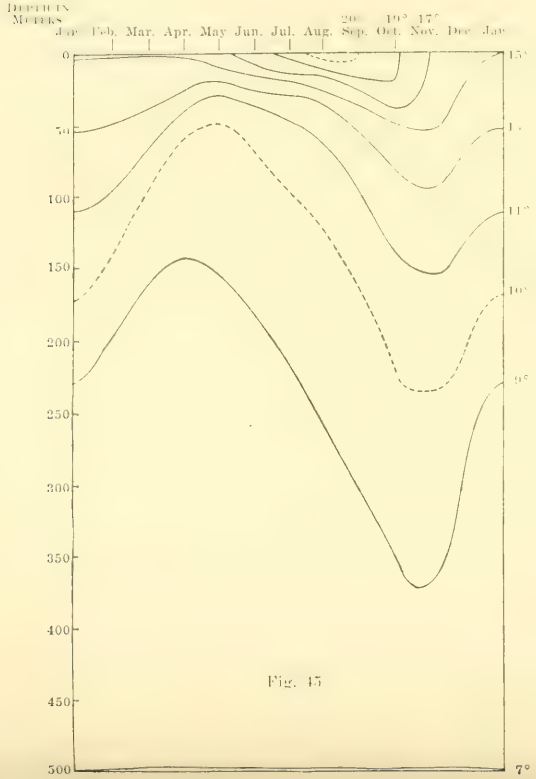

DEPTH IN METERS
Jan. Feb. Mar. Apr. May Jun. Jul. Aug. Sep. Oct. Nov. Dec. Jan.
20° 19° 17°
0
50
100
150
200
250
300
350
400
450
500
15°
11°
10°
9°
7°

Fig. 45

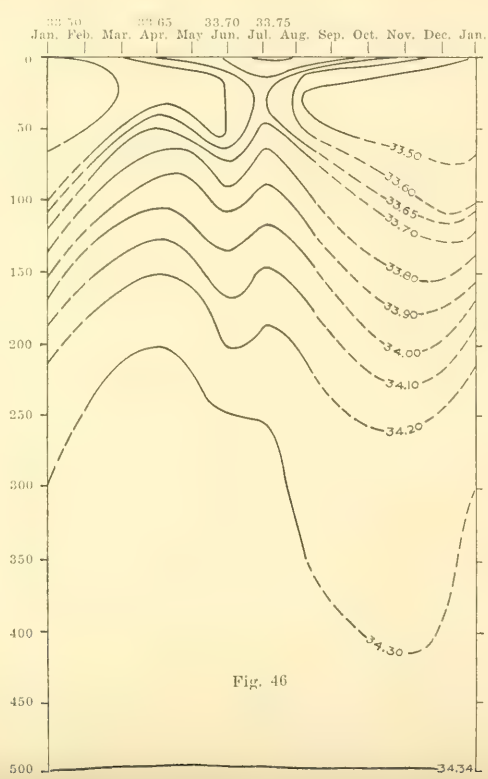

33.50 33.65 33.70 33.75
Jan. Feb. Mar. Apr. May Jun. Jul. Aug. Sep. Oct. Nov. Dec. Jan.
0
50
100
150
200
250
300
350
400
450
500
33.50
33.60
33.65
33.70
33.80
33.90
34.00
34.10
34.20
34.30
34.34

Fig. 46

PLATE 27

Serial temperature curves corresponding to different months and based on observations made approximately eight miles west of South Coronado Island in sections 40_4, 40_5, 40_8, 41_4, 41_5, and 41_8.

NOTE.—The number of observations on which each curve is based is stated. But this number is an underestimate, since it does not include the observations made at the surface where so many more were made than at any other depth.

Fig. 47. Based on 28 observations; February, 1912.

Fig. 48. Based on 33 observations; February, 1913.

Fig. 49. Based on 62 observations; March, 1912.

Fig. 50. Based on 28 observations; April, 1912.

Fig. 51. Based on 69 observations; April, 1913.

Fig. 52. Based on 94 observations; May, 1914.

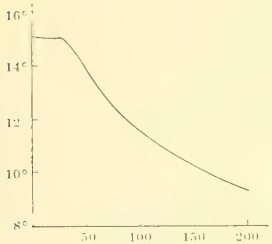


Fig. 47

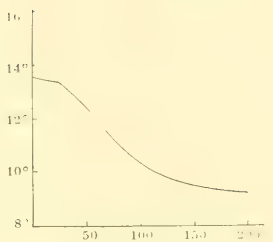


Fig. 48

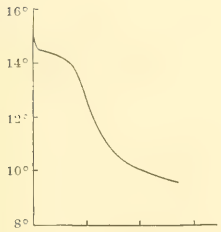


Fig. 49

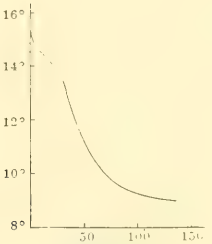


Fig. 50

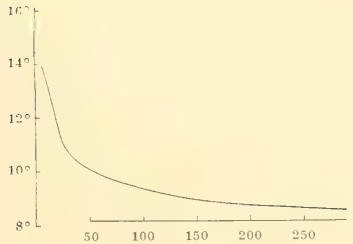


Fig. 51

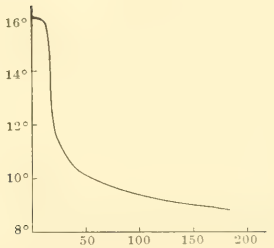


Fig. 52

PLATE 28

Serial temperature curves corresponding to different months and based on observations made approximately eight miles west of South Coronado Island in sections 40_4, 40_5, 40_6, 41_4, 41_5, 41_6 (see note under plate 27 relative to the number of observations).

Fig. 53. Based on 55 observations; May, 1915.

Fig. 54. Based on 380 observations; June, 1911.

Fig. 55. Based on 151 observations; July, 1912.

Fig. 56. Based on 56 observations; August, 1910.

Fig. 57. Based on 117 observations; August, 1911.

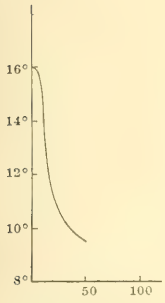


Fig. 53

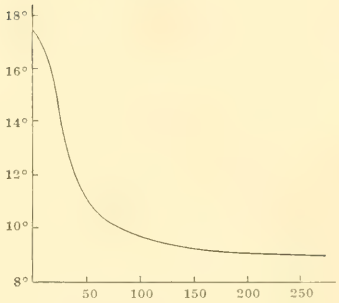


Fig. 54

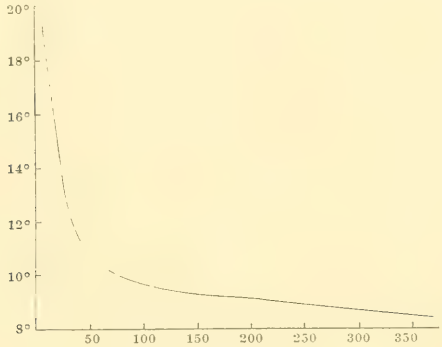


Fig. 55

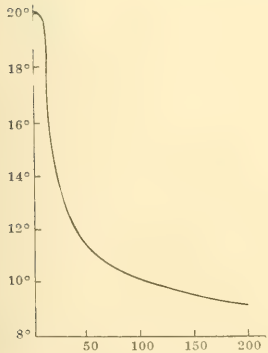


Fig. 56

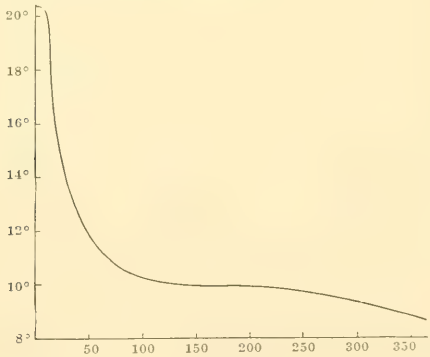


Fig. 57

PLATE 29

Serial temperature and salinity curves corresponding to different months and based on observations made approximately eight miles west of South Coronado Island in sections 40_4, 40_5, 40_6, 41_4, 41_5, and 41_6 (see note under plate 27 relative to the number of observations).

Temperature Curves

Fig. 58. Based on 30 observations; August, 1912.

Fig. 59. Based on 25 observations; October, 1911.

Salinity Curves

Fig. 60. Based on 33 observations; February, 1913.

Fig. 61. Based on 69 observations; April, 1913.

Fig. 62. Based on 94 observations; May, 1914.

Fig. 63. Based on 55 observations; May, 1915.

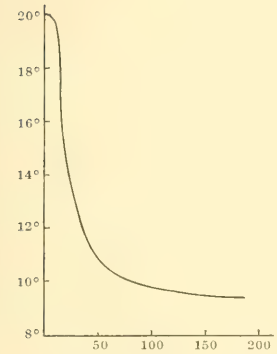


Fig. 58

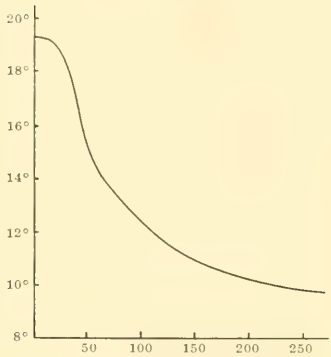


Fig. 59

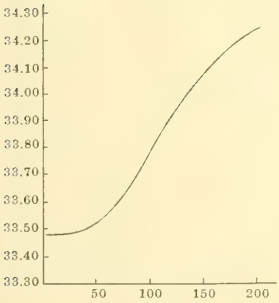


Fig. 60

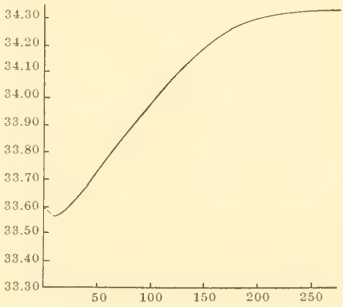


Fig. 61

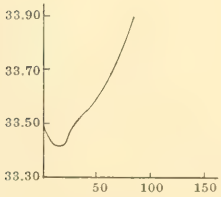


Fig. 62

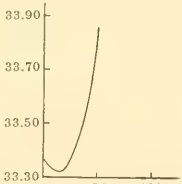


Fig. 63

PLATE 30

Serial salinity curves corresponding to different months and based on observations made approximately eight miles west of South Coronado Island in sections 40_4, 40_5, 40_6, 41_4, 41_5, and 41_6 (see note under plate 27 relative to the number of observations).

Fig. 64. Based on 380 observations; June, 1911.
Fig. 65. Based on 151 observations; July, 1912.
Fig. 66. Based on 56 observations; August, 1910.
Fig. 67. Based on 117 observations; August, 1911.
Fig. 68. Based on 30 observations; August, 1912.

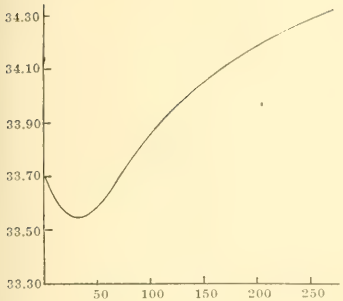


Fig. 64

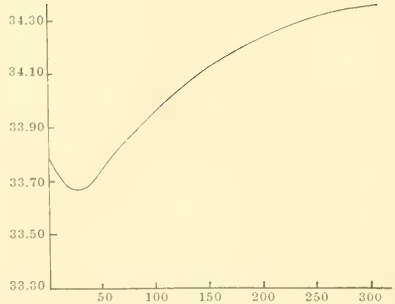


Fig. 65

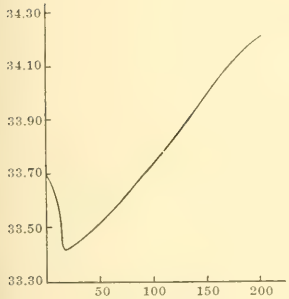


Fig. 66

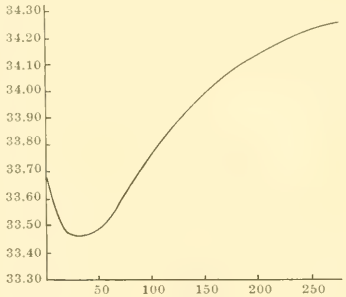


Fig. 67

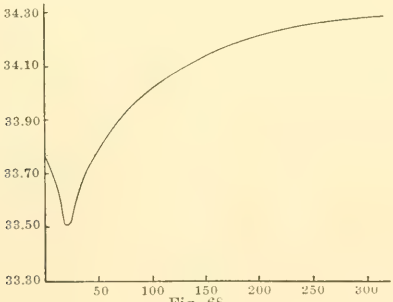


Fig. 68

PLATE 31

Serial temperature and salinity curves corresponding to different months (see note under plate 27 relative to the number of observations).

The curves in figures 69–72 are based on observations made approximately ten miles west of La Jolla in sections 40_9, 40_{10}, 40_{11}, 41_9, 41_{10}, 41_{11}, 42_9, 42_{10}, and 42_{11}.

Temperature Curves

Fig. 69. Based on 21 observations; June, 1911.

Fig. 70. Based on 22 observations; July, 1912.

Salinity Curves

Fig. 71. Based on 21 observations; June, 1911.

Fig. 72. Based on 22 observations; July, 1912.

The curves in figures 73–78 are based on observations made approximately three miles west of the Coronado Islands in sections 39_4 and 39_5.

Temperature Curves

Fig. 73. Based on 29 observations; February, 1913.

Fig. 75. Based on 130 observations; June, 1911.

Fig. 77. Based on 36 observations; August, 1911.

Salinity Curves

Fig. 74. Based on 29 observations; February, 1913.

Fig. 76. Based on 130 observations; June, 1911.

Fig. 78. Based on 36 observations; August, 1911.

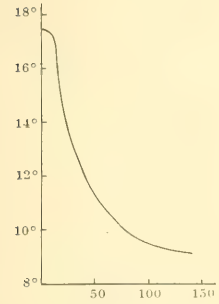


Fig. 69

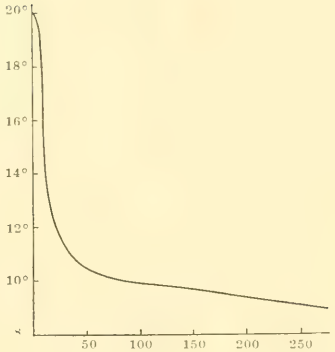


Fig. 70

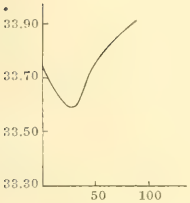


Fig. 71

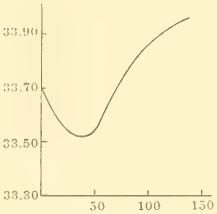


Fig. 72

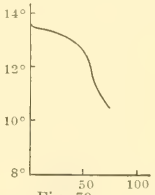


Fig. 73

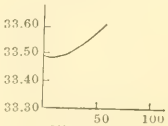


Fig. 74

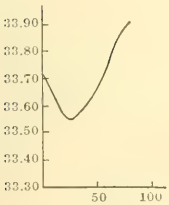


Fig. 76

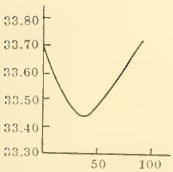


Fig. 78

Fig. 77

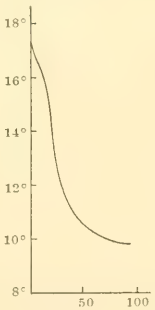


Fig. 75

PLATE 32

Serial temperature and salinity curves corresponding to different months (see note under plate 27 relative to the number of observations).

The curves in figures 79–84 are based on observations made off the west coast of South Coronado Island in section 39_5.

Temperature Curves

Fig. 79. Based on 8 observations; February, 1913.

Fig. 81. Based on 17 observations; June, 1911.

Fig. 83. Based on 11 observations; August, 1911.

Salinity Curves

Fig. 80. Based on 8 observations; February, 1913.

Fig. 82. Based on 17 observations; June, 1911.

Fig. 84. Based on 11 observations; August, 1911.

The curves in figures 85–90 are based on observations made in a region approximately three miles south of Point Loma in section 39_7.

Temperature Curves

Fig. 85. Based on 10 observations; February, 1913.

Fig. 87. Based on 10 observations; June, 1911.

Fig. 89. Based on 6 observations; August, 1911.

Salinity Curves

Fig. 86. Based on 10 observations; February, 1913.

Fig. 88. Based on 10 observations; June, 1911.

Fig. 90. Based on 6 observations; August, 1911.

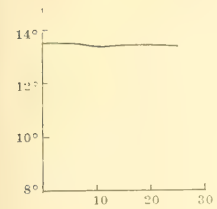


Fig. 79

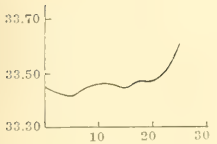


Fig. 80

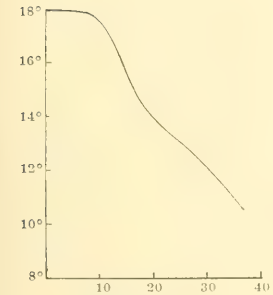


Fig. 81

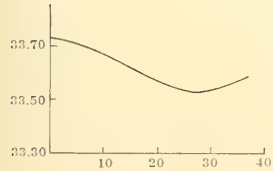
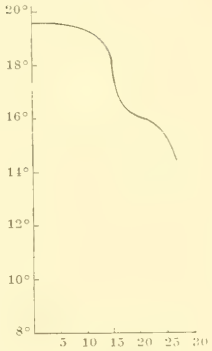


Fig. 82



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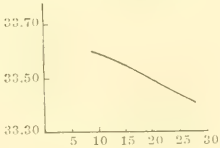
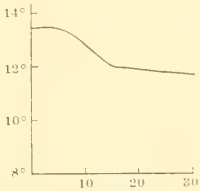


Fig. 84



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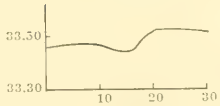


Fig. 86

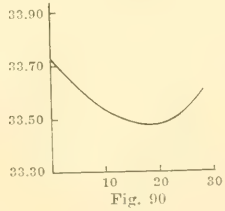
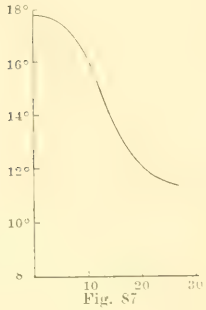


Fig. 90



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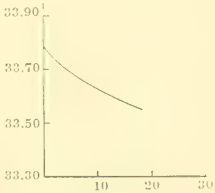


Fig. 88

Fig. 89

PLATE 33

Seasonal variation in surface temperature and salinity of Glorietta Bight (a shallow inlet of the bay) and of San Diego Bay.

Fig. 91. Variation in surface salinity of Glorietta Bight.

Fig. 92. Variation in surface temperature of Glorietta Bight.

Fig. 93. Variation in the surface temperature of San Diego Bay.

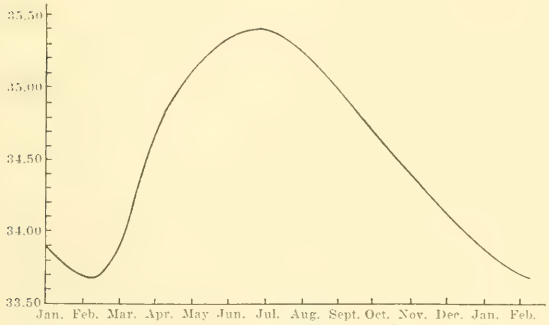


Fig. 91

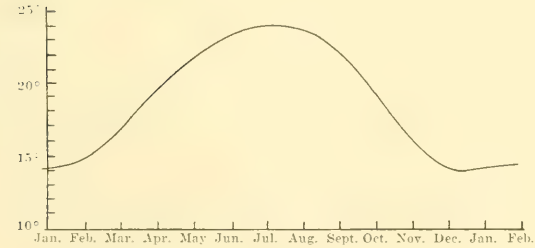


Fig. 92

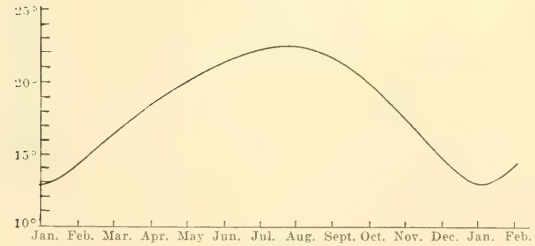
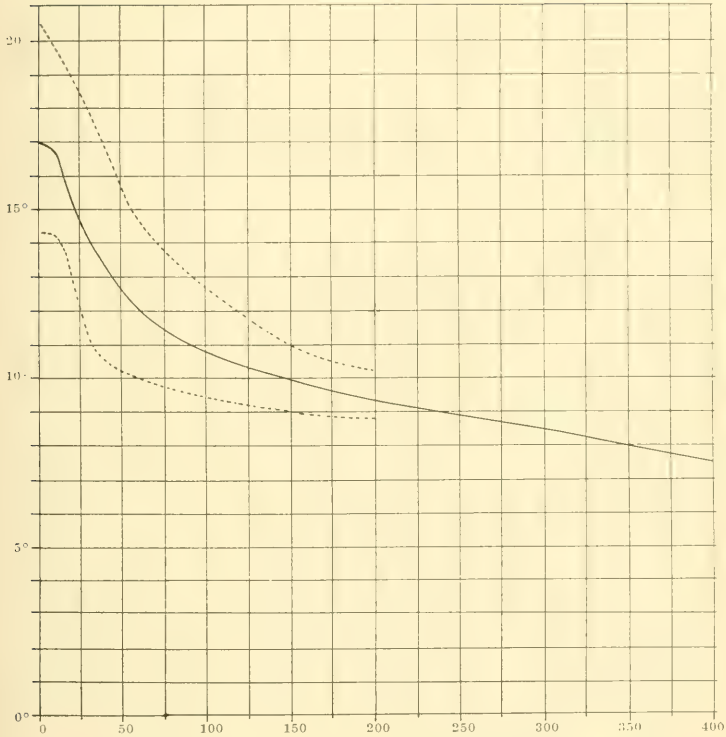


Fig. 93

PLATE 34

Fig. 94. Relation of mean annual temperature to depth and the maximum and minimum monthly average values at each depth, based on observations made in sections 40_4, 40_5, 40_6, 41_4, 41_5, and 41_6.



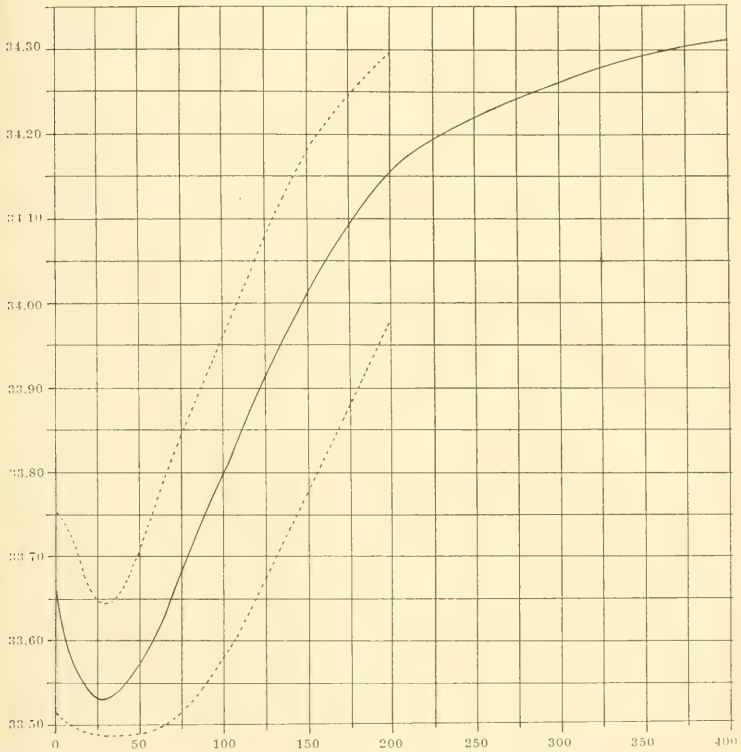
Curve showing relation of mean annual temperature to depth.

Curves showing maximum and minimum temperatures at all depths less than 200 meters.

Fig. 94

PLATE 35

Fig. 95. Relation of mean annual salinity to depth and the maximum and minimum monthly average values at each depth, based on observations made in sections 40_4, 40_5, 40_6, 41_4, 41_5, and 41_6.



——— Curve showing relation of mean annual salinity to depth.

- - - - - - - - Curves showing maximum and minimum salinities at all depths less than 200 meters.

Fig. 95

PLATE 36

Fig. 96. Average relation of temperature to depth from four to fourteen hundred meters.

Fig. 97. Average relation of salinity to depth from four to fourteen hundred meters.

Fig. 98. Relation of temperature to depth in sections 40_4, 40_5, 40_6, 41_4, 41_5, and 41_6 corresponding to February and August.

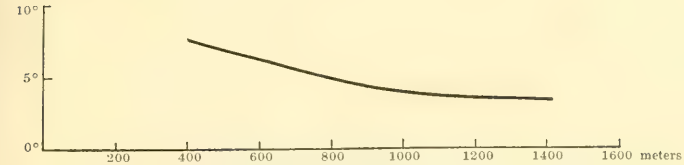


Fig. 96. Curve showing the relation of temperature to depth at depths exceeding 400 meters.

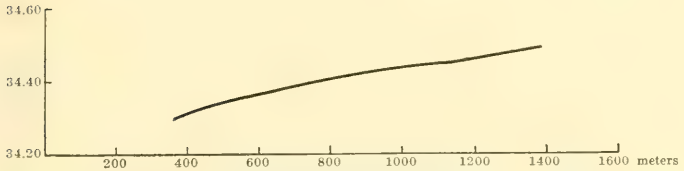


Fig. 97. Curve showing the relation of salinity to depth at depths exceeding 400 meters.

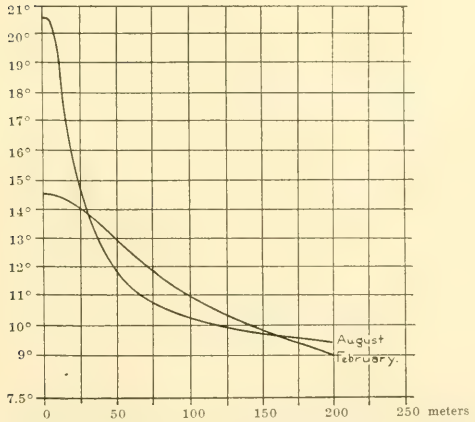


Fig. 98. Curves showing the relation to depth of the mean temperature for the months of February and August.

PLATE 37

Fig. 99. Relation of salinity to depth in sections 40_4, 40_5, 40_6, 41_4, 41_5 and 41_6 corresponding to February and August.

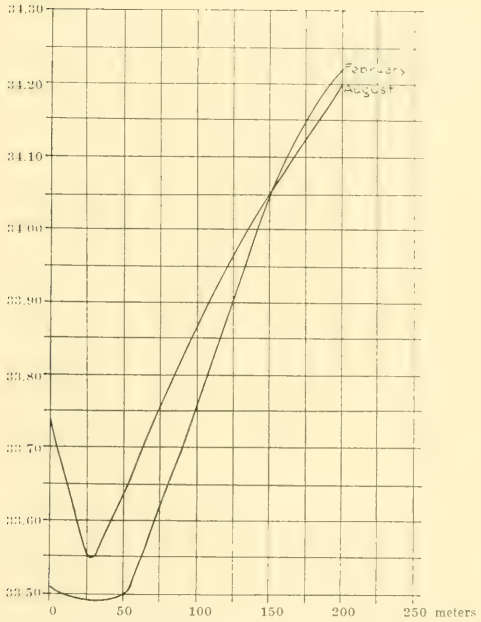


Fig. 99. Curves showing the relation to depth of the mean salinity for the months of February and August.

PLATE 38

Fig. 100. Theoretical average distribution of light intensity with respect to depth and time of day. The number on each curve denotes the intensity, assuming it to be one thousand (1000) at the depth of one meter.

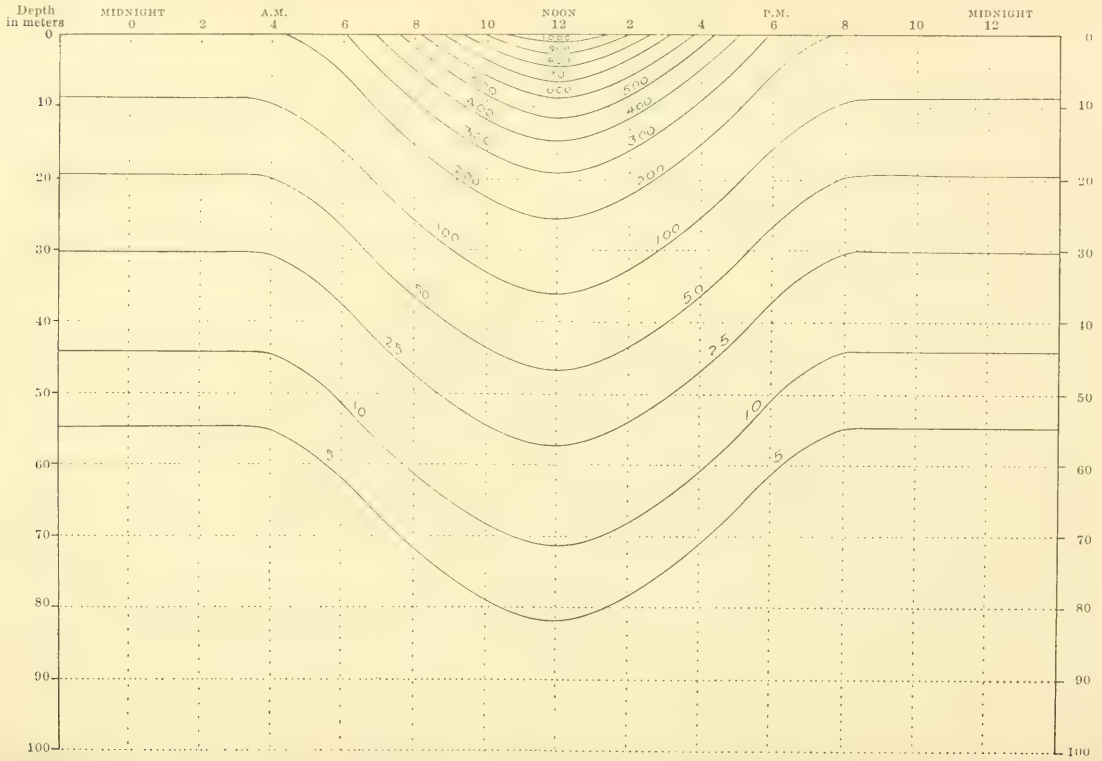


Fig. 100. The distribution of light intensity with respect to depth and time of day.

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